Smithsonian

Contributions to Astrophysics

VOLUME 8, NUMBER 9

STATIC DIFFUSION MODELS OF THE UPPER ATMOSPHERE WITH EMPIRICAL TEMPERATURE PROFILES

by LUIGI G. JACCHIA

SMITHSONIAN INSTITUTION

Washington, D.C.

1965

Publications of the Astrophysical Observatory

This series, *Smithsonian Contributions to Astrophysics*, was inaugurated in 1956 to provide a proper communication for the results of research conducted at the Astrophysical Observatory of the Smithsonian Institution. Its purpose is the "increase and diffusion of knowledge" in the field of astrophysics, with particular emphasis on problems of the sun, the earth, and the solar system. Its pages are open to a limited number of papers by other investigators with whom we have common interests.

Another series is *Annals of the Astrophysical Observatory*. It was started in 1900 by the Observatory's first director, Samuel P. Langley, and has been published about every 10 years since that date. These quarto volumes, some of which are still available, record the history of the Observatory's researches and activities.

Many technical papers and volumes emanating from the Astrophysical Observatory have appeared in the *Smithsonian Miscellaneous Collections*. Among these are *Smithsonian Physical Tables*, *Smithsonian Meteorological Tables*, and *World Weather Records*.

Additional information concerning these publications may be secured from the Editorial and Publications Division, Smithsonian Institution, Washington, D.C.

FRED L. WHIPPLE, *Director*,
Astrophysical Observatory,
Smithsonian Institution.

Cambridge, Mass.

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C., 20402 - Price 40 cents

Static Diffusion Models of the Upper Atmosphere with Empirical Temperature Profiles[1]

Luigi G. Jacchia[2]

1. Static and time-dependent models

The first multitemperature models of the atmosphere above 120 km. based on diffusion equilibrium were produced by Nicolet (1961, 1963). These models proceed from a fixed set of boundary conditions, temperature and partial densities, at 120 km. Above this height the partial densities vary according to diffusion theory, except for hydrogen for which diffusion equilibrium is reached only at greater heights (Kockarts and Nicolet, 1962, 1963); thermal diffusion is taken into account for helium. The vertical temperature distribution is computed for the "hottest" model, i.e., the one with the highest exospheric temperature, assuming thermal equilibrium; the other models are obtained from this model by conduction cooling of the atmosphere in the absence of external energy sources. The temperatures which are obtained in this manner at the height of 150 km. (a nearly isopycnic layer) are linearly connected with the constant temperature at 120 km. Models can be computed by this procedure for conveniently spaced values of the exospheric temperature. These quasistatic models have proved very practical as a background for deriving and analyzing atmospheric densities from satellite drag (Jacchia and Slowey, 1963).

Atmospheric models can be constructed only at the expense of oversimplifications. Such are, for example, the invariance of the boundary conditions at 120 km. and the constant temperature gradient between 120 and 150 km. found in Nicolet's models. Another serious limitation is the assumption of static equilibrium in an atmosphere which is subject to large day-to-night temperature variations, with a period which is not much longer than conduction time in the lower thermosphere.

Atmospheric models which attempt to take into account the diurnal variation at low latitudes have been computed by Harris and Priester (1962a, 1962b). They also assumed fixed boundary conditions at 120 km. and diffusion above this height, but the hydrostatic equation and the heat-conduction equation were integrated simultaneously and the heat input varied with a 24 hour cycle. Since the amount of solar EUV necessary to maintain the heat balance gave diurnal density oscillations much in excess of those observed, Harris and Priester (1962 a, b) were obliged to introduce a second source of heat with a maximum at a different hour. This device may perhaps have a counterpart in the actual heating process, but doubts have been voiced that it may mostly reflect the inadequacy of an oversimplified theory. By suitably varying the "second heat source," the Harris-Priester models can be made to fit the densities from satellite drag with almost any degree of accuracy, and their new version, prepared for the new COSPAR International Reference Atmosphere (CIRA 1965) to be published shortly, is remarkably successful in this respect.

[1] This work was supported in part by grant NsG 87-60 of the National Aeronautics and Space Administration. A preprint of this paper has appeared as Smithsonian Astrophysical Observatory Special Report No. 170. Owing to an imperfection in the numerical-integration program, table 1 in that publication is affected by a small systematic error, whose maximum value, 0.011 in $\log \rho$, occurs at a height around 200 km. when T_∞ is large. For normal satellite heights and temperatures the error amounts to only 0.006 in $\log \rho$, so its practical effect can be considered to be negligible.

[2] Physicist, Smithsonian Astrophysical Observatory.

To analyze or predict the motion of satellites under the influence of drag, one requires models which represent atmospheric variations above all points of the globe in a continuous manner. For this purpose, models of the Nicolet type have a considerable advantage over those of Harris and Priester, because with a suitable model for the geographic temperature distribution above the thermopause they can yield atmospheric densities at any given location and height. The Harris-Priester model is confined to low latitudes and does not account for the seasonal migrations of the diurnal bulge; its extension to higher latitudes would engender gross errors and even a discontinuity at the poles. For this reason, it was deemed advisable to produce a set of atmospheric models patterned after those of Nicolet, but based on the most recent data on composition at the boundary level and density at satellite heights. The result is the present tables.

2. Boundary conditions

The boundary conditions selected for the CIRA 1964 tables are the result of a careful weighing of recent data from instrumented rockets and satellites, and it would be difficult to improve on them at this date. Therefore, we have taken them as the basis for our tables with only one change, namely, the helium concentration which was increased by 40 percent to account for the densities derived from satellites at heights greater than 600 km. at times of low solar activity. There is a distinct possibility that these densities, using a constant value, $C_D=2.2$, of the drag coefficient, are actually overestimated by some 10 to 15 percent, since the drag coefficient should increase as the molecular weight of the atmospheric gas decreases (Izakov, 1965; Cook, 1965). In such case the excess helium required to account for these densities could be somewhat reduced.

At $z=120$ km.

$$T=355°\text{ K},$$
$$n(\text{N}_2)=4.0\times10^{11},$$
$$n(\text{O}_2)=7.5\times10^{10},$$
$$n(\text{O})=7.6\times10^{10},$$
$$n(\text{He})=3.4\times10^{7}.$$

Argon was neglected since its contribution to the total density is only 1 percent at 120 km. and becomes rapidly negligible at greater heights. For hydrogen we have followed Kockarts and Nicolet (1962) and fitted the following equation

$$\log_{10} n(\text{H})_{500}=73.13-39.40\log_{10} T_\infty +5.5(\log_{10} T_\infty)^2 \quad (1)$$

to their concentrations at 500 km., which were used as boundary for the computation of concentrations at greater heights.

Starting from the boundary conditions, the concentrations n_i of each constituent i were computed as a function of the geometric height z by integrating the diffusion equation

$$\frac{dn_i}{n_i}=-\frac{dz}{H_i}-\frac{dT}{T}(1+\alpha). \quad (2)$$

Here, T is the temperature, α the thermal-diffusion factor, and H_i is the scale height of the individual constituent, defined as

$$H_i=\frac{kT}{m_i g}, \quad (3)$$

where k is the Boltzmann constant, m_i the molecular (or atomic) mass of the constituent, and g the acceleration of gravity.

For helium, following Nicolet, we used $\alpha=-0.38$; for N_2, O_2, and O, $\alpha=0$.

3. Temperature profiles

To compute the vertical distribution of temperature on the basis of theory alone, we must know, among many other things, how the heating-energy input varies with height. Since solar EUV is radiated in a discrete number of spectral lines, each of which is absorbed at a different height (Hinteregger, 1962) and each of which varies in intensity with time in a different manner (Purcell *et al.*, 1964), the problem is complicated enough even when we ignore energy sources other than solar EUV. As to temperature and density observations, the lower thermosphere, from 100 to 150 km., is practically *terra incognita* (or, rather, *aer incognitus*). Any present-day atmospheric model must introduce a considerable degree of empiricism in constructing temperature profiles in that region; this is also the case of Nicolet's profiles.

Since an inadequate theory may be worse than none when it must fit a great many accurate observations, as is our case, we decided

to abandon theory entirely in constructing our temperature profiles. A survey of Nicolet's and of the Harris-Priester temperature profiles showed at once that they can all be represented, with a remarkable degree of approximation, by exponential curves of the form

$$T=T_\infty-(T_\infty-T_{120})\exp\,[-s(z-120)], \quad (4)$$

where T_{120} is the temperature at 120 km. and T_∞ the asymptotic (exospheric) temperature;

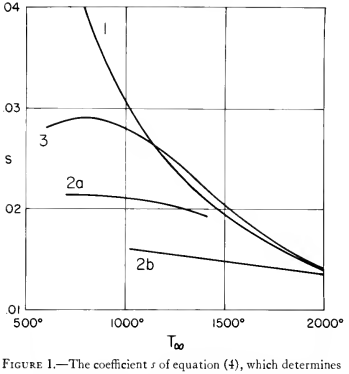

FIGURE 1.—The coefficient s of equation (4), which determines the vertical temperature distribution, as a function of the exospheric temperature T_∞. Curve 1 gives the temperature profiles of Nicolet's (1961) models. Curves 2a and 2b are those pertaining to the Harris-Priester models in the COSPAR International Reference Atmosphere 1965 (2a for 4 a.m., 2b for 2 p.m.). Curve 3 gives the temperature profiles of the present tables.

z is expressed in kilometers and s is a constant different for each profile. If we decide to use equation (4) to represent our temperature profiles, the problem is reduced to finding the value of s appropriate to each value of T_∞, or, better, an analytical expression for $s(T_\infty)$ which will generate temperature profiles capable of reproducing the observed variations of density with height for any stage of solar activity. For example, Nicolet's (1961) densities are reproduced within a few percent with temperature profiles generated by equation (4), with

$$s=34.586T_\infty^{-1}-4.414\times10^{-3}+5.714\times10^{-7}T_\infty$$
$$(1000°<T_\infty<2000°).$$

After a considerable amount of trial-and-error work, we found that the densities derived from satellite drag (Jacchia and Slowey, 1963, plus up-to-date unpublished data) can be satisfactorily represented using temperature profiles generated by the equation

$$\begin{cases} s=0.0291\exp\left(-\dfrac{x^2}{2}\right) \\ x=\dfrac{T_\infty-800}{750+1.722\times10^{-4}(T_\infty-800)^2}. \end{cases} \quad (5)$$

The present tables were computed by the numerical integration of equation (2) starting from the boundary conditions given in section 2 and following the temperature profiles generated by equation (4) with s given by equation (5). In figure 1 these values of s are compared with those which are obtained from the temperature profiles of Nicolet's and the CIRA 1964 models. For the latter, we have selected the curves for 4^h and 14^h local solar time, i.e., the hours of the minimum and of the maximum of the diurnal temperature variation. Since there is no variation of s with the hour of the day in our static models, our s curve must represent an average over the day with a possible drift toward the morning value at the low-temperature end and toward the afternoon values at the high-temperature end.

4. Comparison with Nicolet's models

A revised version (Nicolet II) of Nicolet's original (1961) models, provided to us by the author, has been used by us for the past two years to convert atmospheric densities from satellite drag data into temperatures which are better suited for analysis than the original densities (Jacchia and Slowey, 1963, and various more recent papers). Different temperatures are obtained from the same densities if we use the present models; the corrections to the system of Nicolet II to obtain the temperatures given by our models are plotted in figure 2. As we can see, the correction curves show a systematic negative trend with increasing temperature in the range between 800° and 1700° K. This is equivalent to saying that if we consider a certain density variation within these general temperature limits, this variation corresponds to a somewhat smaller temperature range in the present models. For satellites at heights between 350 and 750 km. (i.e., for

all the satellites analyzed in Jacchia and Slowey, 1963) we obtain temperature variations which are, on the average, smaller by 6 percent.

It should be remembered, of course, that a comparison between temperatures becomes impossible in atmospheric regions where the density is nearly independent of temperature. This situation occurs for heights lower than

FIGURE 2.—Correction to the exospheric temperatures obtained from densities by use of the Nicolet II models to reduce them to temperatures obtained using the present models.

200 km. at sunspot minimum; at sunspot maximum, however, the nearly isopycnic layer extends much higher, to about 300 km. At these heights and in these conditions even a minuscule difference in density corresponds to enormous temperature differences.

5. Formulae for the systematic temperature variations

Formulae for the variation of the exospheric temperature for use with Nicolet's models were given by Jacchia (1964). These formulae necessitate some revision if we want to use the present atmospheric models.

a. **Variation with the solar cycle.**—The relation between the exospheric temperature T_∞ and the 10.7 cm. solar flux $F_{10.7}$, both smoothed over two or three solar rotations, shows practically no departure from linearity in the new temperature system. In figure 3 we have plotted revised values of the nighttime minimum and daytime maximum temperature from satellite drag data covering the years 1958–1964. As can be seen, the smoothed nighttime minima $\overline{T}_0$ can be represented by

$$\overline{T}_0 = 418° + 3.^\circ 60 \overline{F}_{10.7}. \tag{6}$$

The bar indicates averages over two or three solar rotations. The daytime maxima are represented by

$$T_M = 1.28 T_0. \tag{7}$$

The smaller range of the diurnal variation (by a factor of 1.28 instead of 1.30) reflects the overall smaller temperature ranges explained in section 4. It should be recalled that the same diurnal density variation requires a much larger temperature oscillation according to the time-dependent models of Harris and Priester. Although the latter are probably closer to reality, the density variations are represented equally well with the present static models.

Equation (6) is valid for average quiet geomagnetic conditions ($K_p=2$, $a_p=7$). To reduce it to $a_p=0$ the absolute term should read 357° instead of 418°.

b. **Variation within one solar rotation.**—We can use

$$T_0' = \overline{T}_0 + 1.^\circ 8 (F_{10.7} - \overline{F}_{10.7}), \tag{8}$$

i.e., the same equation as given by Jacchia (1964), but with the numerical coefficient changed from 1°.9 to 1°.8. There is some indication that this coefficient might be somewhat smaller (1°.5 or so) near sunspot minimum and larger (possibly 2°.4) near sunspot maximum.

c. **Semiannual variation.**—We can use the formula of Jacchia (1964), with a 6 percent reduction in the amplitudes:

$$T_0 = T_0' + \left(0.37 + 0.14 \sin 2\pi \frac{d-151}{365}\right) \overline{F}_{10.7} \sin 4\pi \frac{d-59}{365} \tag{9}$$

(d in days counted from January 1).

d. **Diurnal variation.**—The same parameters as those found in Jacchia (1964) can be used, except for R, which should be changed from 0.30 to 0.28. For convenience we shall repeat the equations with their explanations.

Let the temperature maximum occur at a point on the globe which has the same latitude as the subsolar point, and let the minimum

nighttime temperature on the globe be T_0 and the maximum daytime temperature on the globe be RT_0. We shall assume that the daytime maxima T_D and nighttime minima T_N at any point on the globe are given by the equations

$$T_D = T_0(1+R\cos^m\eta), \tag{10}$$

$$T_N = T_0(1+R\sin^m\theta),$$

where

$$\eta = \tfrac{1}{2}(\varphi-\delta_\odot),$$

$$\theta = \tfrac{1}{2}(\varphi+\delta_\odot),$$

where φ is the geographic latitude and $\delta_\odot$ the declination of the sun.

The temperature T at this given point can be expressed as a function of the hour angle H of the sun (the local solar time). Let us write

$$T = T_N\left(1+A\cos^n\frac{\tau}{2}\right), \tag{11}$$

with

$$A = \frac{T_D-T_N}{T_N} = R\,\frac{\cos^m\eta-\sin^m\theta}{1+R\sin^m\theta},$$

and

$$\tau = H+\beta+p\sin(H+\gamma) \qquad (-\pi<\tau<\pi) \tag{12}$$

where β, γ, and p are constants, and $H=0$ corresponds to the sun's upper culmination.

The constant β determines the lag of the temperature maximum with respect to the sun's culmination, while p introduces in the temperature curve an asymmetry whose location is determined by γ. Replacing T_D and T_N from equation (10), we can write

$$T = T_0(1+R\sin^m\theta)\left(1+R\,\frac{\cos^m\eta-\sin^m\theta}{1+R\sin^m\theta}\cos^n\frac{\tau}{2}\right). \tag{13}$$

Although in these equations the exponents m and n, which determine the mode of the longitudinal and the latitudinal temperature variations respectively, are kept distinct, we find that in practice we can take $m=n$. There is a distinct possibility that the common value of these coefficients might turn out to be a little smaller than 2.5, the previously assumed value, somewhere between 2.0 and 2.5. We shall adopt the following constants: $R=0.28$, $m=n=2.5$, $\beta=-45°$, $p=12°$, $\gamma=+45°$.

e. Variation with geomagnetic activity.—After the publication of Jacchia (1964), it was found that the relation between the exospheric temperature and the 3 hour geomagnetic index a_p shows a strong departure from linearity for small values of a_p (Jacchia and Slowey, 1964a). The formula given in the last reference can be used without alterations. The increase of temperature with a_p is then

$$\Delta T = 1°.0\,a_p + 125°\,[1-\exp(-0.08\,a_p)]. \tag{14}$$

ΔT represents the atmospheric heating above the level corresponding to $a_p=0$. During

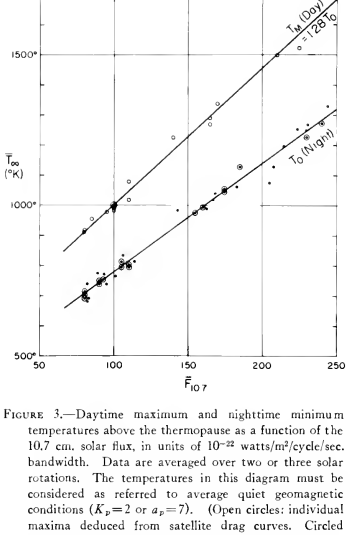

FIGURE 3.—Daytime maximum and nighttime minimum temperatures above the thermopause as a function of the 10.7 cm. solar flux, in units of 10^{-22} watts/m^2/cycle/sec. bandwidth. Data are averaged over two or three solar rotations. The temperatures in this diagram must be considered as referred to average quiet geomagnetic conditions ($K_p=2$ or $a_p=7$). (Open circles: individual maxima deduced from satellite drag curves. Circled dots: individual minima deduced from satellite drag curves. Dots: temperatures reduced to the nighttime minimum at times when the curve of the semiannual temperature variation was close to the annual average.)

magnetic storms the temperature variations lag about 6 hours behind the variations in a_p (Jacchia and Slowey, 1964b). There is evidence that $\Delta T/a_p$ is somewhat larger in high geomagnetic latitudes (Jacchia and Slowey, 1964c).

6. Limitations of the present models

As we stated in section 1, atmospheric models must suffer from the oversimplified assumptions one is obliged to make to construct them. Our models share with those of Nicolet the limitations imposed by the invariance of the temperature profiles and of the boundary conditions; this latter limitation is common also to the Harris-Priester models.

A consequence of the fixed boundary conditions is a nearly isopycnic layer at 200 km. at times of moderate to high solar activity. At such times, according to the models (ours, Nicolet's, and the Harris-Priester models), the density at 200 km. should not show appreciable variations when the exospheric temperature varies. This condition is nearly fulfilled by the diurnal variation which practically disappears at heights lower than 200 km. On the other hand, density variations at the 200 km. level have been observed at times of high solar activity in correspondence with geomagnetic storms, and also of the erratic ("27 day") component of the 10.7 cm. flux (Jacchia, 1959).

The different response of the density at 200 km. to different types of heating could be explained by assuming that the temperature at 120 km. is not subject to a diurnal variation, but increases in correspondence with geomagnetic storms and transient enhancements of solar EUV radiation. If we increase the temperature at 120 km. by 50° without changing the composition, the density at 200 km. will increase, according to our models, by a little over 30 percent when the exospheric temperature is about 1400° K. This is just about the order of magnitude of the erratic density changes observed in Sputnik 2 and 3. At greater heights the density change is more or less the same, decreasing only slightly with height, but its relative importance becomes smaller because of the increased response of the density to changes in the exospheric temperature (or, to be more accurate, to changes in the corresponding temperature gradient above 120 km.).

Satellites at heights as low as 160 km. have recently shown that the density changes during magnetic storms are in phase with those at greater heights (Zirm, 1964). This indicates that most of the heating during these storms must occur at heights considerably lower than 160 km. It therefore looks highly probable that the temperature at 120 km. must undergo changes during a magnetic storm.

If we assume that also the erratic changes in solar EUV affect the temperature at 120 km., it is difficult to see how the much larger variations of EUV in the course of the 11 year solar cycle could leave the temperature at 120 km. undisturbed. Perhaps there is such a change and the construction of better models will be possible when this change becomes known.

7. Comparison with recent satellite-drag data at heights below 200 km.

A valuable collection of drag data on satellites with low perigee heights has been recently presented by Small (1964). These data extend in an unbroken series to heights as low as 160 km., and for one satellite (1962 $\beta\sigma$) to 126 km. Apart from the assumed boundary conditions, our atmospheric models are based on drag data from satellites with perigee mainly above 250 km. and were completed before we had knowledge of Small's densities. It was gratifying to find that the agreement of these densities with our models is excellent, as can be seen from figure 4. In this plot we divided the data into three groups according to the mean exospheric temperature prevalent at the pertinent time, in addition we have separately marked the points derived from Sputnik 3 (1958 $\delta 2$), which are particularly numerous and may be affected by a small systematic error.

According to our models log ρ (ρ=density) at 180 km. varies by about 0.2 from sunspot maximum to sunspot minimum. Since the residuals in log ρ for the three temperature groups do not show any clear evidence of systematic differences, we must conclude that our models represent rather well not only the average densities, but also their variations. Since, however, the density variations below 200 km. are relatively small, the agreement with observations in this region must be ascribed mainly to the boundary conditions, which are obviously satisfactory. The increase in scatter

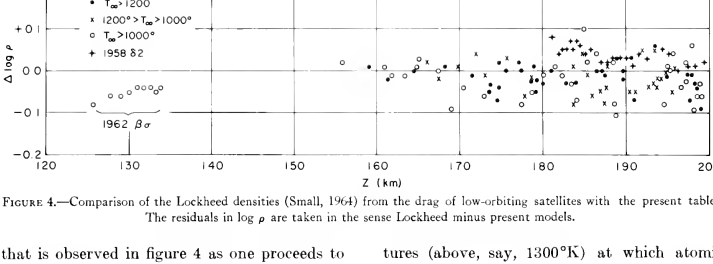

FIGURE 4.—Comparison of the Lockheed densities (Small, 1964) from the drag of low-orbiting satellites with the present tables. The residuals in log ρ are taken in the sense Lockheed minus present models.

that is observed in figure 4 as one proceeds to greater heights is due to the increase in amplitude of the various types of density variations, which—for reasons stated in section 6—we did not attempt to remove Above 200 km. the systematic density variations (diurnal, semiannual, geomagnetic, etc.) become so large that no serious comparison can be made without taking them into account, and a check on the validity of the models is in the inner agreement of temperatures derived from densities determined over a wide range of heights, such as in figure 3.

8. The tables

Detailed data on composition and density are given in table 1 for 30 temperature profiles ending in exospheric temperatures 50° apart and ranging from 650° K to 2100° K. Table 2 gives a summary of the density data only.

The boundary conditions and the temperature profiles are specified in section 3. For the acceleration of gravity we used the formula

$$g=980.665(1+Z/R)^{-2} \text{ cm/sec}^{-2},$$

with $R=6\ 35677\times10^8$ cm.

Hydrogen concentrations are given only above 500 km., as in the CIRA 1965 tables, since hydrogen cannot be considered to be in diffusion equilibrium at lower heights (Kockarts and Nicolet, 1962).

Although the tables extend to a height of 1000 km., the data above 800 km. must be considered as theoretical extrapolations since accurate satellite drag data are not available at those heights. For high exospheric temperatures (above, say, 1300°K) at which atomic oxygen is still the major constituent between 800 and 1000 km., the densities should still be reliable; however, the same cannot be said for lower exospheric temperatures.

The generation of individual densities for given values of z and T_∞ from equations (4) and (5) is so simple that prospective users of these models may deem it preferable to use the formulae rather than the tables to obtain atmospheric densities in electronic-computer programs. In such a case, the extrapolation of the tables to heights above 1000 km., which may be necessary for the sake of continuity in numerical integrations along satellite orbits, is automatic, and the density approaches zero when z increases beyond any limit. If the tables are used and it is desired to have the density ρ approach a limiting value ρ_∞ rather than zero, we can recommend the procedure we have been using for some time in our numerical-integration programs. Compute $b=dln\ \rho/dz=(ln\ 10)\ d\log_{10}\rho/dz$ at 1000 km. from the tabular values of log ρ and use

$$\rho=\rho_\infty+(\rho_{1000}-\rho_\infty)\exp\ [b(z-1000)]. \qquad (z>1000 \text{ km.}) \qquad (15)$$

Acknowledgment

The invaluable help of Mr. Jack Slowey in preparing these tables for computation and for publication is gratefully acknowledged.

References

CIRA
1965. COSPAR International Reference Atmosphere. North-Holland, Amsterdam (in press).

COOK, G. E.
1965. Private communication.
HARRIS, I., and PRIESTER, W.
1962a. Time-dependent structure of the upper atmosphere. Journ. Atmosph. Sci., vol. 19, pp. 286–301.
1962b. Theoretical models for the solar-cycle variations of the upper atmosphere. Journ. Geophys. Res., vol. 67, pp. 4585–4591.
HINTEREGGER, H. E.
1962. Absorption spectrometric analysis of the upper atmosphere in the E.U.V. region. Journ. Atmosph. Sci., vol. 19, pp. 351–368.
IZAKOV, M. N.
1965. Some problems of investigating the structure of the upper atmosphere and constructing its model. *In* P. Muller, ed., Space Research V, North-Holland, Amsterdam, pp. 1191–1213.
JACCHIA, L. G.
1959. Corpuscular radiation and the acceleration of artificial satellites. Nature, vol. 183, pp. 1662–1663.
1964. The temperature above the thermopause. Smithsonian Astrophys. Obs. Spec. Rep., no. 150, 32 pp.
JACCHIA, L. G., and SLOWEY, J.
1963. Accurate drag determinations for eight artificial satellites; atmospheric densities and temperatures. Smithsonian Contr. Astrophys., vol. 8, no. 1, pp. 1–99.
1964a. Temperature variations in the upper atmosphere during geomagnetically quiet intervals. Journ. Geophys. Res., vol. 69, pp. 4145–4148.
1964b. An analysis of the atmospheric drag of the Explorer IX satellite from precisely reduced photographic observations. *In* P. Müller, ed., Space Research IV, North-Holland, Amsterdam, pp. 257–270.
1964c. Atmospheric heating in the auroral zones: a preliminary analysis of the atmospheric drag of the Injun 3 satellite. Journ. Geophys. Res., vol. 69, pp. 905–910.
KOCKARTS, G., and NICOLET, M.
1962. Le problème aéronomique de l'hélium et de l'hydrogène neutres. Ann. de Géophys., vol. 18, pp. 269–290.
1963. L'hélium et l'hydrogène atomique au cours d'un minimum d'activité solaire. Ann. de Géophys., vol. 19, pp. 370–385.
NICOLET, M.
1961. Density of the heterosphere related to temperature. Smithsonian Astrophys. Obs. Spec. Rep., no. 75, 30 pp.
1963. La constitution et la composition de l'atmosphère supérieure. *In* C. DeWitt, J. Hieblot, and A. Lebean, eds., Geophysics, The Earth's Environment, Gordon and Breach, Science Publishers, New York.
PURCELL, J. D.; GARRETT, D. L.; and TOUSEY, R.
1964. Spectroheliograms in the extreme ultraviolet (abstract). Astron. Journ., vol. 69, p. 147.
SMALL, H. W.
1964. Atmospheric density between 70 and 200 nautical miles from satellite observations. Lockheed Missiles and Space Company, Tracking Note no. 23.
ZIRM, R. R.
1964. Variations in decay rate of satellites. Journ. Geophys. Res., vol. 69, pp. 4696–4697.

Abstract

Tables of atmospheric density and composition are computed for a wide range of exospheric temperatures, starting from a fixed set of boundary conditions at 120 km. The diffusion equation is integrated following empirical temperature profiles of exponential form capable of reproducing the densities derived from satellite drag over the years. Formulae are given which relate the exospheric temperature to solar and geomagnetic activity and allow for the diurnal and semiannual variations. The different response of the density at the 200 km. level to different types of heating is briefly discussed.

Tables

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature

EXOSPHERIC TEMPERATURE = 2100 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	573.0	10.3227	10.5007	11.0926	7.3555		26.33	19.21	0.7715E-11	-11.113
140.0	763.7	9.9618	10.2579	10.7611	7.2526		25.98	26.13	0.3651E-11	-11.438
150.0	933.8	9.6909	10.0794	10.5132	7.1762		25.49	32.43	0.2096E-11	-11.679
160.0	1076.7	9.4719	9.9383	10.3136	7.1174		25.14	38.16	0.1346E-11	-11.871
170.0	1234.5	9.2866	9.8213	10.1454	7.0702		24.81	43.39	0.9290E-12	-12.032
180.0	1316.4	9.1249	9.7212	9.9990	7.0308		24.51	48.16	0.6749E-12	-12.171
190.0	1414.3	8.9805	9.6334	9.8686	6.9973		24.22	52.52	0.5048E-12	-12.293
200.0	1499.9	8.8491	9.5549	9.7504	6.9683		23.94	56.53	0.3947E-12	-12.404
210.0	1574.9	8.7279	9.4837	9.6417	6.9426		23.66	60.21	0.3132E-12	-12.504
220.0	1640.5	8.6148	9.4183	9.5405	6.9197		23.40	63.62	0.2530E-12	-12.597
230.0	1697.9	8.5082	9.3576	9.4453	6.8995		23.15	66.77	0.2074E-12	-12.683
240.0	1749.1	8.4071	9.3007	9.3552	6.8821		22.90	69.71	0.1721E-12	-12.764
250.0	1792.1	8.3105	9.2470	9.2693	6.8676		22.65	72.45	0.1443E-12	-12.841
260.0	1830.5	8.2176	9.1959	9.1869	6.8465		22.41	75.03	0.1221E-12	-12.913
270.0	1864.2	8.1280	9.1471	9.1074	6.8313		22.18	77.45	0.1043E-12	-12.983
280.0	1893.6	8.0412	9.1003	9.0304	6.8171		21.95	79.73	0.8924E-13	-13.049
290.0	1919.4	7.9566	9.0550	8.9556	6.8036		21.72	81.90	0.7705E-13	-13.114
300.0	1942.0	7.8738	9.0112	8.8826	6.7907		21.50	83.97	0.6677E-13	-13.175
320.0	1979.3	7.7136	8.9273	8.7414	6.7666		21.08	87.83	0.5089E-13	-13.293
340.0	2007.3	7.5589	8.8465	8.6051	6.7442		20.67	91.39	0.3936E-13	-13.405
360.0	2029.0	7.4093	8.7689	8.4737	6.7231		20.28	94.72	0.3081E-13	-13.511
380.0	2045.7	7.2611	8.6935	8.3434	6.7029		19.91	97.86	0.2438E-13	-13.613
400.0	2058.4	7.1166	8.6199	8.2166	6.6835		19.55	100.84	0.1946E-13	-13.711
420.0	2068.1	6.9743	8.5478	8.0918	6.6647		19.22	103.68	0.1565E-13	-13.805
440.0	2075.6	6.8339	8.4768	7.9687	6.6467		18.91	106.41	0.1268E-13	-13.897
460.0	2081.3	6.6952	8.4068	7.8471	6.6294		18.61	109.05	0.1034E-13	-13.985
480.0	2085.7	6.5579	8.3377	7.7267	6.6107		18.33	111.59	0.8479E-14	-14.072
500.0	2089.0	6.4218	8.2693	7.6075	6.5934	2.9454	18.07	114.05	0.6989E-14	-14.156
520.0	2091.6	6.2868	8.2016	7.4893	6.5762	2.9406	17.82	116.45	0.5789E-14	-14.237
540.0	2093.6	6.1530	8.1344	7.3720	6.5593	2.9360	17.59	118.78	0.4816E-14	-14.317
560.0	2095.1	6.0201	8.0678	7.2556	6.5425	2.9315	17.37	121.06	0.4022E-14	-14.396
580.0	2096.2	5.8881	8.0017	7.1401	6.5258	2.9271	17.17	123.29	0.3373E-14	-14.472
600.0	2097.1	5.7570	7.9361	7.0252	6.5093	2.9228	16.97	125.48	0.2838E-14	-14.547
620.0	2097.9	5.6267	7.8709	6.9112	6.4930	2.9185	16.78	127.65	0.2396E-14	-14.621
640.0	2098.3	5.4972	7.8061	6.7978	6.4767	2.9144	16.60	129.80	0.2028E-14	-14.693
660.0	2098.7	5.3686	7.7417	6.6852	6.4606	2.9102	16.43	131.94	0.1723E-14	-14.764
680.0	2099.0	5.2407	7.6777	6.5732	6.4446	2.9061	16.26	134.08	0.1467E-14	-14.834
700.0	2099.2	5.1135	7.6141	6.4619	6.4286	2.9021	16.10	136.23	0.1252E-14	-14.902
750.0	2099.6	4.7989	7.4568	6.1864	6.3892	2.8921	15.70	141.75	0.8516E-15	-15.070
800.0	2099.8	4.4888	7.3017	5.9149	6.3504	2.8823	15.29	147.63	0.5869E-15	-15.231
850.0	2099.9	4.1830	7.1488	5.6472	6.3121	2.8726	14.85	154.37	0.4093E-15	-15.388
900.0	2099.9	3.8814	6.9980	5.3832	6.2744	2.8631	14.38	161.33	0.2886E-15	-15.540
950.0	2100.0	3.5839	6.8493	5.1228	6.2372	2.8538	13.87	169.66	0.2056E-15	-15.687
1000.0	2100.0	3.2906	6.7026	4.8659	6.2005	2.8445	13.30	179.35	0.1490E-15	-15.830

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 2050 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	13.8751	13.4808	11.6221	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	572.2	13.4231	13.5011	11.0930	7.3558		26.33	19.14	0.7722E-11	-11.112
140.0	761.6	13.2624	13.2587	10.7617	7.2532		25.88	26.56	0.3657E-11	-11.437
150.0	926.7	13.1914	13.0806	10.5139	7.1771		25.49	32.35	0.2150E-11	-11.678
160.0	1070.7	13.1722	12.9337	10.3142	7.1187		25.13	37.96	0.1348E-11	-11.870
170.0	1196.2	13.2867	12.8229	10.1458	7.0717		24.81	43.10	0.9303E-12	-12.031
180.0	1305.6	13.1246	12.7228	9.9992	7.0326		24.50	47.78	0.6754E-12	-12.170
190.0	1401.0	13.1797	12.6353	9.8685	6.9989		24.20	52.05	0.5090E-12	-12.293
200.0	1484.2	13.8477	12.5565	9.7498	6.9704		23.92	55.97	0.3966E-12	-12.401
210.0	1556.7	13.7258	12.4852	9.6405	6.9446		23.65	59.56	0.3178E-12	-12.505
220.0	1619.9	13.6123	12.4197	9.5387	6.9221		23.38	62.88	0.2524E-12	-12.598
230.0	1675.0	13.5047	12.3587	9.4433	6.9014		23.12	65.95	0.2067E-12	-12.685
240.0	1723.1	13.4027	12.3016	9.3522	6.8826		22.87	68.80	0.1713E-12	-12.766
250.0	1765.0	13.3052	12.2476	9.2654	6.8652		22.62	71.47	0.1435E-12	-12.843
260.0	1801.5	13.2113	12.1962	9.1822	6.8491		22.37	73.96	0.1212E-12	-12.917
270.0	1833.3	13.1206	12.1471	9.1018	6.8340		22.14	76.31	0.1031E-12	-12.987
280.0	1861.1	13.0326	12.0998	9.0239	6.8197		21.90	78.51	0.8835E-13	-13.054
290.0	1885.3	12.9468	12.0541	8.9481	6.8062		21.67	80.63	0.7611E-13	-13.119
300.0	1906.4	12.8630	12.0098	8.8742	6.7933		21.45	82.63	0.6590E-13	-13.181
320.0	1940.9	12.7003	11.9246	8.7308	6.7691		21.02	86.39	0.5006E-13	-13.301
340.0	1967.0	12.5429	11.8432	8.5923	6.7466		20.60	89.84	0.3859E-13	-13.414
360.0	1986.9	12.3896	11.7641	8.4575	6.7252		20.21	93.09	0.3011E-13	-13.521
380.0	2002.1	12.2396	11.6874	8.3257	6.7048		19.83	96.14	0.2374E-13	-13.625
400.0	2013.6	12.0922	11.6125	8.1964	6.6851		19.47	99.05	0.1888E-13	-13.724
420.0	2022.3	11.9469	11.5389	8.0690	6.6660		19.14	101.83	0.1514E-13	-13.820
440.0	2029.0	11.8035	11.4665	7.9433	6.6474		18.82	104.50	0.1223E-13	-13.913
460.0	2034.0	11.6617	11.3951	7.8190	6.6291		18.52	107.08	0.9936E-14	-14.003
480.0	2037.8	11.5213	11.3244	7.6959	6.6111		18.24	109.57	0.8121E-14	-14.090
500.0	2040.8	11.3821	11.2545	7.5740	6.5934	2.9752	17.98	111.98	0.6672E-14	-14.176
520.0	2043.0	11.2440	11.1853	7.4531	6.5759	2.9704	17.73	114.32	0.5509E-14	-14.259
540.0	2044.7	11.1070	11.1166	7.3331	6.5586	2.9657	17.50	116.61	0.4568E-14	-14.340
560.0	2045.9	10.9710	11.0484	7.2139	6.5414	2.9612	17.28	118.84	0.3804E-14	-14.420
580.0	2046.9	10.8358	10.9808	7.0956	6.5244	2.9567	17.07	121.03	0.3183E-14	-14.498
600.0	2047.7	10.7016	10.9136	6.9781	6.5075	2.9523	16.88	123.17	0.2667E-14	-14.574
620.0	2048.2	10.5682	10.8468	6.8613	6.4908	2.9480	16.69	125.32	0.2245E-14	-14.649
640.0	2048.6	10.4356	10.7805	6.7452	6.4742	2.9437	16.51	127.43	0.1895E-14	-14.722
660.0	2049.0	10.3038	10.7146	6.6298	6.4576	2.9395	16.34	129.55	0.1605E-14	-14.795
680.0	2049.2	10.1729	10.6490	6.5151	6.4412	2.9353	16.17	131.67	0.1363E-14	-14.866
700.0	2049.4	10.0426	10.5839	6.4011	6.4249	2.9312	16.00	133.81	0.1160E-14	-14.936
750.0	2049.7	9.7204	10.4227	6.1190	6.3846	2.9215	15.59	139.34	0.7833E-15	-15.106
800.0	2049.8	9.4027	10.2639	5.8409	6.3448	2.9119	15.16	145.28	0.5340E-15	-15.271
850.0	2049.9	9.0894	10.1072	5.5668	6.3056	2.9011	14.71	151.87	0.3713E-15	-15.430
900.0	2050.0	8.7805	9.9528	5.2961	6.2669	2.8913	14.21	159.38	0.2601E-15	-15.585
950.0	2050.0	8.4758	9.8004	5.0294	6.2288	2.8817	13.66	168.10	0.1842E-15	-15.735
1000.0	2050.0	8.1753	9.6502	4.7663	6.1912	2.8722	13.05	178.32	0.1318E-15	-15.880

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 2000 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	13.8751	13.8838	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	571.7	13.3234	13.5315	11.0933	7.3601		26.13	19.17	0.7728E-11	-11.112
140.0	759.9	12.9629	13.2595	10.7623	7.2538		25.88	26.30	0.3662E-11	-11.436
150.0	923.1	12.6919	13.0817	10.5146	7.1741		25.48	32.19	0.2173E-11	-11.677
160.0	1065.0	12.4727	12.9411	10.3149	7.1159		25.13	37.76	0.1350E-11	-11.870
170.0	1188.1	12.2870	12.8245	10.1464	7.0731		24.90	42.82	0.8919E-12	-12.050
180.0	1295.1	12.1246	12.7245	9.9996	7.0343		24.69	47.41	0.6764E-12	-12.170
190.0	1387.9	11.9792	12.6368	12.9685	7.0012		24.19	51.59	0.5095E-12	-12.293
200.0	1468.5	11.8466	12.5583	12.7495	6.9725		23.90	55.41	0.3947E-12	-12.404
210.0	1538.5	11.7241	12.4869	12.6397	6.9472		23.63	58.92	0.3126E-12	-12.505
220.0	1599.1	11.6096	12.4212	12.5373	6.9245		23.36	62.14	0.2523E-12	-12.599
230.0	1652.1	11.5015	12.3601	12.4409	6.9042		23.09	65.17	0.2062E-12	-12.686
240.0	1697.9	11.3986	12.3027	12.3493	6.8853		22.84	67.93	0.1707E-12	-12.768
250.0	1737.7	11.3001	12.2485	12.2618	6.8680		22.58	70.47	0.1427E-12	-12.845
260.0	1772.2	11.2052	12.1967	12.1777	6.8518		22.34	72.89	0.1204E-12	-12.919
270.0	1802.2	11.1134	12.1472	12.0965	6.8368		22.10	75.15	0.1023E-12	-12.990
280.0	1828.1	11.0242	12.0996	12.0176	6.8225		21.86	77.33	0.8751E-13	-13.058
290.0	1850.9	10.9373	12.0533	11.9408	6.8090		21.63	79.34	0.7527E-13	-13.123
300.0	1871.5	10.8523	12.0085	11.8658	6.7961		21.40	81.28	0.6507E-13	-13.187
320.0	1902.4	10.6870	11.9222	11.7222	6.7719		20.96	84.91	0.4926E-13	-13.308
340.0	1926.4	10.5268	11.8394	11.5793	6.7490		20.53	88.23	0.3783E-13	-13.422
360.0	1944.5	10.3706	11.7593	11.4420	6.7275		20.13	91.43	0.2942E-13	-13.531
380.0	1958.2	10.2176	11.6813	11.3077	6.7068		19.75	94.41	0.2311E-13	-13.636
400.0	1968.5	10.0671	11.6049	11.1756	6.6869		19.39	97.24	0.1832E-13	-13.737
420.0	1976.2	9.9187	11.5298	11.0455	6.6675		19.05	99.96	0.1464E-13	-13.835
440.0	1982.1	9.7721	11.4559	10.9173	6.6485		18.73	102.57	0.1178E-13	-13.929
460.0	1986.5	9.6273	11.3829	10.7909	6.6299		18.43	105.09	0.9536E-14	-14.021
480.0	1989.8	9.4834	11.3107	10.6660	6.6115		18.15	107.52	0.7767E-14	-14.110
500.0	1992.3	9.3403	11.2392	10.5426	6.5934	3.0070	17.89	109.88	0.6360E-14	-14.197
520.0	1994.2	9.1985	11.1683	10.4154	6.5755	3.0021	17.64	112.18	0.5234E-14	-14.281
540.0	1995.6	9.0592	11.0980	10.2925	6.5578	2.9974	17.41	114.41	0.4326E-14	-14.364
560.0	1996.7	8.9199	11.0282	10.1705	6.5403	2.9928	17.19	116.60	0.3591E-14	-14.445
580.0	1997.5	8.7814	10.9589	10.0493	6.5229	2.9883	16.98	118.75	0.2992E-14	-14.524
600.0	1998.1	8.6439	10.8900	9.9289	6.5056	2.9838	16.79	120.87	0.2502E-14	-14.602
620.0	1998.6	8.5072	10.8216	9.8092	6.4884	2.9794	16.60	122.97	0.2099E-14	-14.678
640.0	1998.9	8.3714	10.7537	9.6903	6.4714	2.9751	16.42	125.05	0.1767E-14	-14.753
660.0	1999.2	8.2363	10.6861	9.5720	6.4545	2.9707	16.24	127.15	0.1491E-14	-14.826
680.0	1999.4	8.1021	10.6190	9.4545	6.4377	2.9665	16.07	129.25	0.1262E-14	-14.899
700.0	1999.5	7.9686	10.5522	9.3377	6.4210	2.9622	15.90	131.38	0.1071E-14	-14.970
750.0	1999.8	7.6383	10.3871	9.0485	6.3796	2.9518	15.48	136.93	0.7180E-15	-15.144
800.0	1999.9	7.3127	10.2243	8.7634	6.3388	2.9415	15.08	142.96	0.4878E-15	-15.312
850.0	1999.9	6.9916	10.0637	8.4823	6.2987	2.9314	14.55	149.74	0.3355E-15	-15.474
900.0	2000.0	6.6750	9.9054	8.2051	6.2590	2.9214	14.03	157.55	0.2334E-15	-15.632
950.0	2000.0	6.3627	9.7492	7.9317	6.2200	2.9115	13.44	166.71	0.1643E-15	-15.784
1000.0	2000.0	6.0546	9.5952	7.6620	6.1814	2.9016	12.79	177.55	0.1169E-15	-15.932

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1950 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	571.3	10.3236	10.5018	11.0935	7.3652		26.33	19.16	3.7732E-11	-11.112
140.0	758.2	9.9634	10.2602	10.7629	7.2543		25.88	25.95	0.3667E-11	-11.436
150.0	919.8	9.6926	10.0828	10.5154	7.1785		25.48	32.06	0.2107E-11	-11.676
160.0	1059.5	9.4734	9.9425	10.3158	7.1211		25.13	37.57	0.1353E-11	-11.869
170.0	1180.2	9.2875	9.8261	10.1472	7.0746		24.79	42.55	0.9339E-12	-12.030
180.0	1284.6	9.1247	9.7266	10.0002	7.0361		24.48	47.05	0.6777E-12	-12.169
190.0	1374.8	8.9789	9.6387	9.8688	7.0032		24.18	51.13	0.5102E-12	-12.292
200.0	1452.8	8.8469	9.5602	9.7493	6.9747		23.89	54.85	0.3950E-12	-12.403
210.0	1520.2	8.7227	9.4888	9.6391	6.9496		23.61	58.26	0.3126E-12	-12.505
220.0	1578.5	8.6074	9.4239	9.5361	6.9271		23.34	61.39	0.2518E-12	-12.599
230.0	1628.9	8.4985	9.3617	9.4393	6.9067		23.07	64.28	0.2057E-12	-12.687
240.0	1672.4	8.3947	9.3041	9.3467	6.8880		22.81	66.95	0.1701E-12	-12.769
250.0	1710.1	8.2952	9.2495	9.2584	6.8708		22.55	69.45	0.1421E-12	-12.848
260.0	1742.6	8.1992	9.1974	9.1736	6.8547		22.30	71.78	0.1196E-12	-12.922
270.0	1770.7	8.1063	9.1475	9.0912	6.8397		22.05	73.98	0.1015E-12	-12.993
280.0	1795.0	8.0159	9.0993	9.0113	6.8254		21.81	76.06	0.8669E-13	-13.062
290.0	1816.0	7.9277	9.0527	8.9335	6.8119		21.57	78.02	0.7444E-13	-13.128
300.0	1834.2	7.8414	9.0074	8.8573	6.7989		21.34	79.90	0.6424E-13	-13.192
320.0	1863.5	7.6733	8.9199	8.7094	6.7745		20.89	83.42	0.4846E-13	-13.315
340.0	1885.3	7.5103	8.8358	8.5660	6.7516		20.47	86.68	0.3708E-13	-13.431
360.0	1901.7	7.3510	8.7543	8.4261	6.7298		20.06	89.75	0.2872E-13	-13.542
380.0	1913.9	7.1948	8.6748	8.2890	6.7089		19.67	92.65	0.2248E-13	-13.648
400.0	1923.0	7.0410	8.5969	8.1541	6.6886		19.31	95.41	0.1775E-13	-13.751
420.0	1929.8	6.8893	8.5203	8.0211	6.6689		18.96	98.06	0.1413E-13	-13.850
440.0	1934.9	6.7394	8.4447	7.8897	6.6496		18.64	100.61	0.1133E-13	-13.946
460.0	1938.7	6.5909	8.3701	7.7596	6.6306		18.34	103.07	0.9138E-14	-14.039
480.0	1941.6	6.4437	8.2962	7.6307	6.6118		18.06	105.45	0.7416E-14	-14.130
500.0	1943.7	6.2978	8.2230	7.5029	6.5933	3.2429	17.79	107.76	0.6051E-14	-14.218
520.0	1945.3	6.1530	8.1504	7.3760	6.5750	3.0360	17.55	110.01	0.4962E-14	-14.304
540.0	1946.5	6.0092	8.0784	7.2501	6.5569	3.0313	17.31	112.20	0.4087E-14	-14.389
560.0	1947.4	5.8663	8.0068	7.1250	6.5390	3.0266	17.10	114.34	0.3381E-14	-14.471
580.0	1948.0	5.7244	7.9358	7.0008	6.5211	3.0219	16.89	116.45	0.2808E-14	-14.552
600.0	1948.5	5.5834	7.8653	6.8773	6.5034	3.0174	16.69	118.53	0.2340E-14	-14.631
620.0	1948.9	5.4433	7.7951	6.7546	6.4859	3.0129	16.50	120.60	0.1957E-14	-14.708
640.0	1949.2	5.3040	7.7255	6.6326	6.4684	3.0085	16.32	122.66	0.1642E-14	-14.785
660.0	1949.4	5.1655	7.6562	6.5114	6.4511	3.0041	16.14	124.73	0.1381E-14	-14.860
680.0	1949.5	5.0279	7.5874	6.3909	6.4338	2.9997	15.97	126.83	0.1165E-14	-14.934
700.0	1949.7	4.8910	7.5189	6.2711	6.4167	2.9953	15.80	128.96	0.9858E-15	-15.006
750.0	1949.8	4.5523	7.3495	5.9745	6.3743	2.9846	15.36	134.54	0.6556E-15	-15.183
800.0	1949.9	4.2183	7.1825	5.6821	6.3325	2.9741	14.99	140.69	0.4420E-15	-15.355
850.0	1950.0	3.8880	7.0179	5.3938	6.2913	2.9637	14.39	147.69	0.3018E-15	-15.520
900.0	1950.0	3.5642	6.8555	5.1095	6.2506	2.9535	13.82	155.86	0.2085E-15	-15.681
950.0	1950.0	3.2439	6.6953	4.8291	6.2105	2.9434	13.30	165.53	0.1458E-15	-15.836
1000.0	1950.0	2.9280	6.5374	4.5525	6.1710	2.9334	12.81	177.07	0.1031E-15	-15.987

TABLE 1.--Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1000 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	356.0	10.8751	10.8838	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	571.0	10.3238	10.5229	11.0937	7.3634		26.31	19.15	0.7735E-11	-11.112
140.0	756.8	9.9639	10.2600	10.7635	7.2548		25.88	25.93	0.3672E-11	-11.435
150.0	916.6	9.6933	10.0840	10.5162	7.1737		25.48	31.96	0.2111E-11	-11.675
160.0	1054.1	9.4741	9.9440	10.3167	7.1223		25.12	37.39	0.1356E-11	-11.868
170.0	1172.4	9.2881	9.8279	10.1481	7.0762		24.79	42.27	0.9362E-12	-12.029
180.0	1274.1	9.1251	9.7283	10.0029	7.0379		24.47	46.68	0.6792E-12	-12.168
190.0	1361.6	8.9784	9.6408	9.8693	7.0053		24.17	50.66	0.5111E-12	-12.291
200.0	1436.9	8.8453	9.5623	9.7494	6.9770		23.88	54.28	0.3955E-12	-12.403
210.0	1501.6	8.7215	9.4908	9.6386	6.9521		23.59	57.59	0.3127E-12	-12.505
220.0	1557.3	8.6056	9.4249	9.5351	6.9297		23.31	60.62	0.2516E-12	-12.599
230.0	1605.2	8.4956	9.3634	9.4373	6.9095		23.04	63.41	0.2053E-12	-12.688
240.0	1646.4	8.3908	9.3055	9.3442	6.8909		22.78	66.00	0.1696E-12	-12.771
250.0	1681.9	8.2903	9.2506	9.2550	6.8737		22.52	68.41	0.1414E-12	-12.850
260.0	1712.4	8.1932	9.1982	9.1691	6.8577		22.26	70.66	0.1189E-12	-12.925
270.0	1738.6	8.0991	9.1478	9.0858	6.8427		22.01	72.78	0.1007E-12	-12.997
280.0	1761.7	8.0074	9.0992	9.0049	6.8284		21.76	74.78	0.8588E-13	-13.066
290.0	1780.6	7.9179	9.0521	8.9259	6.8149		21.52	76.68	0.7361E-13	-13.133
300.0	1797.3	7.8302	9.0062	8.8486	6.8019		21.29	78.50	0.6341E-13	-13.198
320.0	1824.0	7.6592	8.9175	8.6981	6.7773		20.83	81.90	0.4765E-13	-13.322
340.0	1843.8	7.4930	8.8320	8.5521	6.7542		20.39	85.07	0.3632E-13	-13.440
360.0	1858.4	7.3305	8.7491	8.4094	6.7322		19.98	88.04	0.2802E-13	-13.553
380.0	1869.2	7.1709	8.6680	8.2693	6.7110		19.59	90.87	0.2184E-13	-13.661
400.0	1877.2	7.0137	8.5885	8.1315	6.6904		19.22	93.56	0.1718E-13	-13.765
420.0	1883.1	6.8585	8.5102	7.9954	6.6703		18.87	96.15	0.1362E-13	-13.866
440.0	1887.5	6.7049	8.4329	7.8609	6.6506		18.55	98.64	0.1087E-13	-13.964
460.0	1890.8	6.5528	8.3565	7.7276	6.6312		18.24	101.04	0.8739E-14	-14.059
480.0	1893.2	6.4020	8.2808	7.5955	6.6120		17.96	103.37	0.7066E-14	-14.151
500.0	1894.9	6.2524	8.2058	7.4645	6.5931	3.0772	17.70	105.63	0.5744E-14	-14.241
520.0	1896.3	6.1039	8.1314	7.3345	6.5744	3.0722	17.45	107.82	0.4692E-14	-14.329
540.0	1897.2	5.9564	8.0576	7.2053	6.5559	3.0674	17.22	109.97	0.3851E-14	-14.414
560.0	1898.0	5.8099	7.9842	7.0770	6.5374	3.0626	17.00	112.07	0.3174E-14	-14.498
580.0	1898.5	5.6644	7.9114	6.9496	6.5191	3.0579	16.79	114.14	0.2627E-14	-14.581
600.0	1898.9	5.5197	7.8390	6.8229	6.5010	3.0533	16.60	116.18	0.2182E-14	-14.661
620.0	1899.2	5.3759	7.7671	6.6970	6.4830	3.0487	16.41	118.22	0.1818E-14	-14.740
640.0	1899.4	5.2330	7.6956	6.5719	6.4651	3.0441	16.22	120.26	0.1520E-14	-14.818
660.0	1899.5	5.0909	7.6245	6.4475	6.4473	3.0396	16.04	122.32	0.1274E-14	-14.895
680.0	1899.7	4.9496	7.5539	6.3238	6.4296	3.0351	15.86	124.41	0.1072E-14	-14.970
700.0	1899.8	4.8092	7.4836	6.2008	6.4120	3.0307	15.69	126.54	0.9034E-15	-15.044
750.0	1899.9	4.4615	7.3098	5.8965	6.3685	3.0197	15.23	132.14	0.5959E-15	-15.225
800.0	1899.9	4.1198	7.1384	5.5964	6.3256	3.0089	14.74	138.48	0.3985E-15	-15.400
850.0	1900.0	3.7808	6.9696	5.3005	6.2833	2.9982	14.20	145.76	0.2705E-15	-15.569
900.0	1900.0	3.4475	6.8028	5.0087	6.2416	2.9877	13.60	154.34	0.1852E-15	-15.732
950.0	1900.0	3.1148	6.6384	4.7209	6.2005	2.9774	12.93	164.61	0.1286E-15	-15.891
1000.0	1900.0	2.7945	6.4763	4.4371	6.1599	2.9672	12.19	176.85	0.9046E-16	-16.044

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1850 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(A) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.7	10.8751	10.8896	11.6021	7.5915		28.90	11.42	3.2461E-10	-10.489
130.0	572.8	10.3239	10.6021	11.7939	7.3694		28.83	19.14	0.7738E-11	-11.111
140.0	755.5	9.9645	10.2615	10.7640	7.2552		25.88	25.86	0.3676E-11	-11.435
150.0	913.5	9.6941	10.0451	10.5171	7.1806		25.49	31.95	0.2116E-11	-11.675
160.0	1048.7	9.4753	9.9456	10.3174	7.1235		25.12	37.23	0.1360E-11	-11.866
170.0	1166.4	9.2989	9.8798	10.1492	7.0797		24.78	41.99	0.9387E-12	-12.027
180.0	1268.3	9.1256	9.7304	10.0018	7.0458		24.46	46.33	0.6809E-12	-12.167
190.0	1356.3	8.9789	9.6430	9.8699	7.0075		24.16	50.18	0.5122E-12	-12.291
200.0	1432.5	8.8448	9.5646	9.7436	6.9754		23.86	53.73	0.3962E-12	-12.402
210.0	1498.5	8.7203	9.4939	9.6283	6.9547		23.57	56.90	0.3129E-12	-12.505
220.0	1555.6	8.6034	9.4277	9.5241	6.9325		23.29	59.83	0.2515E-12	-12.599
230.0	1603.9	8.4927	9.3653	9.4356	6.9124		23.02	62.53	0.2050E-12	-12.688
240.0	1619.8	8.3869	9.3071	9.3416	6.8935		22.75	65.02	0.1693E-12	-12.772
250.0	1651.0	8.2852	9.2519	9.2615	6.8768		22.48	67.34	0.1407E-12	-12.852
260.0	1681.5	8.1869	9.1997	9.1646	6.8609		22.22	69.51	0.1182E-12	-12.927
270.0	1705.8	8.0915	9.1482	9.0803	6.8458		21.97	71.55	0.9993E-13	-13.000
280.0	1726.6	7.9985	9.0991	9.0002	6.8316		21.71	73.49	0.8503E-13	-13.070
290.0	1744.4	7.9075	9.0513	8.9190	6.8180		21.47	75.32	0.7276E-13	-13.138
300.0	1759.7	7.8183	9.0048	8.8394	6.8050		21.23	77.07	0.6256E-13	-13.204
320.0	1783.7	7.6442	8.9149	8.6863	6.7803		20.76	80.36	0.4680E-13	-13.330
340.0	1801.6	7.4747	8.8279	8.5373	6.7569		20.32	83.42	0.3553E-13	-13.449
360.0	1814.8	7.3087	8.7434	8.3916	6.7346		19.90	86.31	0.2729E-13	-13.564
380.0	1824.0	7.1456	8.6607	8.2490	6.7131		19.50	89.06	0.2114E-13	-13.674
400.0	1831.0	6.9847	8.5794	8.1074	6.6921		19.13	91.69	0.1659E-13	-13.780
420.0	1836.1	6.8257	8.4993	7.9681	6.6716		18.78	94.21	0.1310E-13	-13.883
440.0	1839.8	6.6683	8.4202	7.8302	6.6515		18.45	96.64	0.1041E-13	-13.982
460.0	1842.5	6.5124	8.3419	7.6936	6.6317		18.15	98.99	0.8336E-14	-14.079
480.0	1844.5	6.3578	8.2643	7.5582	6.6121		17.86	101.26	0.6713E-14	-14.173
500.0	1846.0	6.2043	8.1874	7.4238	6.5927	3.1160	17.60	103.47	0.5435E-14	-14.265
520.0	1847.1	6.0519	8.1111	7.2903	6.5735	3.1159	17.35	105.62	0.4423E-14	-14.354
540.0	1847.9	5.9005	8.0353	7.1578	6.5545	3.1063	17.12	107.72	0.3617E-14	-14.442
560.0	1848.4	5.7501	7.9601	7.0261	6.5356	3.1011	16.90	109.78	0.2970E-14	-14.527
580.0	1848.9	5.6007	7.8853	6.8952	6.5169	3.0963	16.69	111.81	0.2448E-14	-14.611
600.0	1849.2	5.4521	7.8110	6.7652	6.4983	3.0915	16.50	113.83	0.2026E-14	-14.693
620.0	1849.4	5.3045	7.7371	6.6359	6.4798	3.0868	16.31	115.84	0.1682E-14	-14.774
640.0	1849.5	5.1577	7.6637	6.5074	6.4614	3.0822	16.12	117.86	0.1401E-14	-14.853
660.0	1849.7	5.0118	7.5907	6.3797	6.4431	3.0775	15.94	119.90	0.1171E-14	-14.932
680.0	1849.8	4.8667	7.5182	6.2527	6.4249	3.0730	15.75	121.99	0.9809E-15	-15.008
700.0	1849.8	4.7225	7.4461	6.1264	6.4069	3.0684	15.57	124.13	0.8249E-15	-15.084
750.0	1849.9	4.3655	7.2676	5.8138	6.3622	3.0571	15.15	129.96	0.5387E-15	-15.269
800.0	1850.0	4.0135	7.0916	5.5057	6.3182	3.0460	14.68	136.46	0.3573E-15	-15.447
850.0	1850.0	3.6664	6.9180	5.2018	6.2747	3.0351	14.20	143.76	0.2401E-15	-15.620
900.0	1850.0	3.3241	6.7469	4.9021	6.2319	3.0243	13.76	153.03	0.1635E-15	-15.787
950.0	1850.0	2.9865	6.5782	4.6065	6.1898	3.0137	12.64	164.30	0.1128E-15	-15.948
1000.0	1850.0	2.6534	6.4119	4.3150	6.1483	3.0032	11.85	177.26	0.7896E-16	-16.103

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1800 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	579.7	10.3241	10.5022	11.0940	7.3605		26.33	19.14	0.7740E-11	-11.111
140.0	754.2	9.9650	10.2622	10.7646	7.2557		25.87	25.81	0.3681E-11	-11.434
150.0	910.3	9.6950	10.0863	10.5180	7.1815		25.48	31.74	0.2121E-11	-11.674
160.0	1043.1	9.4759	9.9472	10.3189	7.1248		25.12	37.00	0.1366E-11	-11.865
170.0	1156.0	9.2897	9.8318	10.1503	7.0794		24.78	41.70	0.9414E-12	-12.026
180.0	1252.2	9.1262	9.7326	10.0028	7.0417		24.46	45.90	0.6828E-12	-12.166
190.0	1333.9	8.9790	9.6454	9.8706	7.0097		24.15	49.68	0.5134E-12	-12.290
200.0	1403.5	8.8443	9.5669	9.7498	6.9820		23.85	53.09	0.3967E-12	-12.402
210.0	1462.7	8.7190	9.4953	9.6379	6.9574		23.55	56.19	0.3131E-12	-12.504
220.0	1513.0	8.6013	9.4291	9.5330	6.9354		23.27	59.01	0.2513E-12	-12.600
230.0	1555.9	8.4895	9.3672	9.4337	6.9154		22.99	61.61	0.2046E-12	-12.689
240.0	1592.3	8.3827	9.3087	9.3389	6.8971		22.71	64.01	0.1685E-12	-12.774
250.0	1623.3	8.2798	9.2531	9.2478	6.8801		22.44	66.24	0.1400E-12	-12.854
260.0	1649.7	8.1802	9.1998	9.1597	6.8641		22.18	68.33	0.1174E-12	-12.930
270.0	1672.1	8.0834	9.1485	9.0743	6.8491		21.92	70.29	0.9907E-13	-13.004
280.0	1691.2	7.9889	9.0988	8.9909	6.8349		21.66	72.15	0.8413E-13	-13.075
290.0	1707.4	7.8964	9.0504	8.9094	6.8212		21.41	73.92	0.7183E-13	-13.144
300.0	1721.3	7.8056	9.0033	8.8295	6.8081		21.17	75.60	0.6162E-13	-13.210
320.0	1743.0	7.6282	8.9118	8.6734	6.7832		20.69	78.78	0.4591E-13	-13.338
340.0	1758.7	7.4551	8.8233	8.5214	6.7596		20.24	81.76	0.3469E-13	-13.460
360.0	1770.1	7.2854	8.7371	8.3725	6.7370		19.81	84.56	0.2653E-13	-13.576
380.0	1778.4	7.1184	8.6526	8.2260	6.7151		19.41	87.24	0.2050E-13	-13.688
400.0	1784.4	6.9536	8.5694	8.0816	6.6938		19.03	89.80	0.1598E-13	-13.796
420.0	1788.7	6.7906	8.4874	7.9388	6.6729		18.68	92.26	0.1256E-13	-13.901
440.0	1791.8	6.6292	8.4063	7.7974	6.6523		18.35	94.63	0.9944E-14	-14.002
460.0	1794.1	6.4692	8.3261	7.6572	6.6320		18.05	96.92	0.7926E-14	-14.101
480.0	1795.7	6.3104	8.2465	7.5182	6.6119		17.76	99.15	0.6356E-14	-14.197
500.0	1796.9	6.1528	8.1675	7.3802	6.5921	3.1574	17.50	101.30	0.5125E-14	-14.290
520.0	1797.8	5.9963	8.0892	7.2431	6.5724	3.1522	17.25	103.40	0.4154E-14	-14.382
540.0	1798.4	5.8408	8.0114	7.1070	6.5529	3.1472	17.02	105.46	0.3383E-14	-14.471
560.0	1798.8	5.6863	7.9340	6.9717	6.5335	3.1422	16.80	107.48	0.2767E-14	-14.558
580.0	1799.1	5.5327	7.8572	6.8372	6.5142	3.1373	16.59	109.47	0.2272E-14	-14.644
600.0	1799.4	5.3801	7.7809	6.7036	6.4951	3.1324	16.39	111.46	0.1873E-14	-14.728
620.0	1799.6	5.2284	7.7050	6.5708	6.4761	3.1276	16.20	113.45	0.1549E-14	-14.810
640.0	1799.7	5.0776	7.6296	6.4387	6.4572	3.1228	16.01	115.46	0.1285E-14	-14.891
660.0	1799.8	4.9276	7.5546	6.3074	6.4384	3.1181	15.82	117.50	0.1070E-14	-14.971
680.0	1799.8	4.7785	7.4800	6.1769	6.4198	3.1134	15.64	119.59	0.8929E-15	-15.049
700.0	1799.9	4.6303	7.4059	6.0471	6.4012	3.1087	15.45	121.76	0.7473E-15	-15.126
750.0	1799.9	4.2634	7.2225	5.7259	6.3553	3.0971	14.98	127.60	0.4842E-15	-15.315
800.0	1800.0	3.9016	7.0416	5.4092	6.3100	3.0857	14.40	134.33	0.3183E-15	-15.497
850.0	1800.0	3.5449	6.8632	5.0969	6.2654	3.0745	13.78	142.32	0.2121E-15	-15.673
900.0	1800.0	3.1931	6.6873	4.7889	6.2214	3.0634	13.09	151.99	0.1433E-15	-15.844
950.0	1800.0	2.8461	6.5138	4.4851	6.1780	3.0525	12.31	163.76	0.9819E-16	-16.008
1000.0	1800.0	2.5038	6.3427	4.1854	6.1351	3.0417	11.48	178.08	0.6828E-16	-16.166

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1750 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.7461E-10	-10.604
130.0	570.5	10.3242	10.5024	11.0941	7.3606		26.33	19.13	0.1743E-10	-11.111
140.0	752.7	9.9657	10.2629	10.7653	7.2562		25.87	25.76	0.3687E-11	-11.433
150.0	906.8	9.6959	10.0876	10.5190	7.1824		25.48	31.67	0.2126E-11	-11.673
160.0	1037.1	9.4769	9.9490	10.3201	7.1261		25.11	36.80	0.1368E-11	-11.864
170.0	1147.2	9.2906	9.8339	10.1515	7.0811		24.77	41.39	0.9443E-12	-12.025
180.0	1240.3	9.1267	9.7350	10.0038	7.0438		24.45	45.49	0.6847E-12	-12.164
190.0	1319.1	8.9791	9.6478	9.8712	7.0122		24.13	49.15	0.5145E-12	-12.289
200.0	1385.6	8.8437	9.5694	9.7500	6.9846		23.83	52.45	0.3973E-12	-12.401
210.0	1441.9	8.7176	9.4977	9.6375	6.9603		23.53	55.44	0.3132E-12	-12.504
220.0	1489.5	8.5989	9.4313	9.5318	6.9385		23.24	58.16	0.2511E-12	-12.600
230.0	1529.8	8.4861	9.3691	9.4316	6.9186		22.96	60.66	0.2041E-12	-12.690
240.0	1563.8	8.3780	9.3103	9.3358	6.9004		22.68	62.96	0.1678E-12	-12.775
250.0	1592.6	8.2738	9.2542	9.2436	6.8834		22.40	65.11	0.1392E-12	-12.856
260.0	1616.9	8.1728	9.2005	9.1543	6.8675		22.13	67.11	0.1165E-12	-12.934
270.0	1637.4	8.0745	9.1486	9.0676	6.8525		21.87	69.00	0.9810E-13	-13.008
280.0	1654.8	7.9784	9.0982	8.9829	6.8382		21.61	70.78	0.8313E-13	-13.080
290.0	1669.5	7.8843	9.0492	8.9000	6.8245		21.35	72.48	0.7082E-13	-13.150
300.0	1682.0	7.7917	9.0013	8.8186	6.8114		21.10	74.11	0.6061E-13	-13.217
320.0	1701.4	7.6106	8.9083	8.6594	6.7862		20.62	77.19	0.4495E-13	-13.347
340.0	1715.2	7.4337	8.8181	8.5040	6.7623		20.16	80.06	0.3380E-13	-13.471
360.0	1725.1	7.2600	8.7300	8.3517	6.7394		19.72	82.79	0.2572E-13	-13.590
380.0	1732.2	7.0889	8.6435	8.2016	6.7171		19.32	85.39	0.1978E-13	-13.704
400.0	1737.3	6.9199	8.5584	8.0535	6.6953		18.93	87.89	0.1535E-13	-13.814
420.0	1740.9	6.7526	8.4743	7.9070	6.6739		18.58	90.29	0.1200E-13	-13.921
440.0	1743.5	6.5869	8.3911	7.7618	6.6529		18.25	92.60	0.9461E-14	-14.024
460.0	1745.4	6.4225	8.3087	7.6179	6.6321		17.94	94.84	0.7507E-14	-14.125
480.0	1746.7	6.2594	8.2270	7.4750	6.6115		17.66	97.01	0.5993E-14	-14.222
500.0	1747.6	6.0974	8.1459	7.3332	6.5911	3.2016	17.39	99.12	0.4811E-14	-14.318
520.0	1748.3	5.9365	8.0654	7.1923	6.5709	3.1964	17.15	101.18	0.3883E-14	-14.411
540.0	1748.8	5.7767	7.9854	7.0523	6.5509	3.1912	16.91	103.19	0.3149E-14	-14.502
560.0	1749.1	5.6178	7.9059	6.9132	6.5309	3.1862	16.69	105.17	0.2565E-14	-14.591
580.0	1749.4	5.4599	7.8269	6.7750	6.5111	3.1811	16.49	107.13	0.2097E-14	-14.678
600.0	1749.6	5.3029	7.7484	6.6376	6.4915	3.1761	16.29	109.09	0.1722E-14	-14.764
620.0	1749.7	5.1469	7.6704	6.5010	6.4719	3.1712	16.09	111.06	0.1418E-14	-14.848
640.0	1749.8	4.9918	7.5928	6.3652	6.4525	3.1663	15.90	113.06	0.1172E-14	-14.931
660.0	1749.8	4.8376	7.5157	6.2301	6.4332	3.1614	15.70	115.11	0.9717E-15	-15.012
680.0	1749.9	4.6842	7.4390	6.0959	6.4140	3.1566	15.51	117.22	0.8078E-15	-15.093
700.0	1749.9	4.5318	7.3628	5.9624	6.3950	3.1517	15.31	119.41	0.6735E-15	-15.172
750.0	1750.0	4.1544	7.1741	5.6320	6.3477	3.1398	14.79	125.41	0.4321E-15	-15.364
800.0	1750.0	3.7823	6.9880	5.3063	6.3012	3.1281	14.20	132.44	0.2815E-15	-15.551
850.0	1750.0	3.4154	6.8046	4.9850	6.2553	3.1166	13.53	140.90	0.1860E-15	-15.731
900.0	1750.0	3.0535	6.6236	4.6682	6.2100	3.1052	12.78	151.26	0.1247E-15	-15.904
950.0	1750.0	2.6966	6.4452	4.3558	6.1653	3.0939	11.96	163.97	0.8486E-16	-16.071
1000.0	1750.0	2.3445	6.2691	4.0476	6.1213	3.0828	11.07	179.51	0.5869E-16	-16.231

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1700 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.93	11.62	0.2461E-10	-10.609
130.0	570.3	10.3244	10.5026	11.0943	7.3607		26.33	19.12	7.7747E-11	-11.111
140.0	751.1	9.9663	10.2637	10.7665	7.2567		25.87	25.71	3.3693E-11	-11.473
150.0	903.0	9.6968	10.0890	10.5201	7.1834		25.47	31.49	1.2131E-11	-11.671
160.0	1030.5	9.4779	9.9508	10.3213	7.1276		25.11	36.57	4.1372E-12	-11.863
170.0	1137.7	9.2914	9.8361	10.1526	7.0830		24.76	41.06	1.9472E-12	-12.024
180.0	1227.7	9.1272	9.7374	10.0047	7.0461		24.44	45.04	9.6866E-12	-12.163
190.0	1303.3	8.9790	9.6504	9.8718	7.0147		24.12	48.59	5.0157E-12	-12.288
200.0	1366.8	8.8428	9.5719	9.7505	6.9875		23.81	51.79	2.7977E-12	-12.490
210.0	1420.1	8.7158	9.5001	9.6367	6.9633		23.51	54.65	1.6132E-12	-12.504
220.0	1464.9	8.5960	9.4335	9.5302	6.9417		23.21	57.27	9.2508E-12	-12.601
230.0	1502.5	8.4820	9.3710	9.4290	6.9220		22.92	59.66	5.2335E-12	-12.691
240.0	1534.1	8.3726	9.3118	9.3321	6.9038		22.64	61.88	3.1679E-12	-12.777
250.0	1560.7	8.2669	9.2552	9.2386	6.8869		22.36	63.93	1.9383E-12	-12.859
260.0	1583.0	8.1644	9.2009	9.1481	6.8710		22.08	65.85	1.1954E-12	-12.938
270.0	1601.7	8.0644	9.1483	9.0600	6.8560		21.81	67.66	0.9699E-13	-13.013
280.0	1617.4	7.9666	9.0973	8.9738	6.8416		21.55	69.39	0.8200E-13	-13.086
290.0	1630.7	7.8707	9.0475	8.8893	6.8279		21.28	71.05	0.6968E-13	-13.157
300.0	1641.8	7.7762	8.9989	8.8063	6.8146		21.03	72.59	0.5949E-13	-13.226
320.0	1658.9	7.5912	8.9041	8.6437	6.7892		20.54	75.55	0.4389E-13	-13.358
340.0	1671.0	7.4101	8.8120	8.4848	6.7650		20.07	78.34	0.3244E-13	-13.489
360.0	1679.5	7.2321	8.7219	8.3287	6.7416		19.63	80.99	0.2406E-13	-13.619
380.0	1685.6	7.0566	8.6333	8.1748	6.7189		19.22	83.53	0.1902E-13	-13.721
400.0	1689.8	6.8830	8.5460	8.0228	6.6967		18.83	85.96	0.1468E-13	-13.833
420.0	1692.8	6.7112	8.4597	7.8723	6.6748		18.47	88.31	0.1143E-13	-13.942
440.0	1694.9	6.5409	8.3743	7.7231	6.6532		18.14	90.57	0.8962E-14	-14.048
460.0	1696.4	6.3719	8.2896	7.5751	6.6319		17.83	92.75	0.7077E-14	-14.150
480.0	1697.5	6.2041	8.2056	7.4282	6.6107		17.55	94.87	0.5623E-14	-14.250
500.0	1698.2	6.0375	8.1221	7.2823	6.5898	3.2490	17.28	96.93	0.4494E-14	-14.347
520.0	1698.7	5.8720	8.0393	7.1373	6.5690	3.2436	17.04	98.94	0.3611E-14	-14.442
540.0	1699.1	5.7075	7.9570	6.9933	6.5484	3.2384	16.80	100.91	0.2915E-14	-14.535
560.0	1699.4	5.5440	7.8752	6.8501	6.5279	3.2331	16.58	102.85	0.2364E-14	-14.626
580.0	1699.6	5.3815	7.7940	6.7079	6.5075	3.2280	16.38	104.79	0.1925E-14	-14.716
600.0	1699.7	5.2199	7.7132	6.5664	6.4873	3.2229	16.17	106.72	0.1573E-14	-14.803
620.0	1699.8	5.0593	7.6329	6.4258	6.4672	3.2178	15.97	108.68	0.1290E-14	-14.889
640.0	1699.8	4.8996	7.5530	6.2860	6.4472	3.2127	15.77	110.68	0.1062E-14	-14.974
660.0	1699.9	4.7409	7.4736	6.1471	6.4273	3.2077	15.58	112.74	0.8766E-15	-15.057
680.0	1699.9	4.5830	7.3947	6.0089	6.4076	3.2027	15.37	114.88	0.7257E-15	-15.139
700.0	1699.9	4.4261	7.3162	5.8715	6.3880	3.1978	15.17	117.12	0.6025E-15	-15.220
750.0	1700.0	4.0376	7.1220	5.5314	6.3393	3.1855	14.61	123.32	0.3827E-15	-15.417
800.0	1700.0	3.6546	6.9305	5.1960	6.2914	3.1735	13.98	130.71	0.2469E-15	-15.607
850.0	1700.0	3.2769	6.7416	4.8654	6.2442	3.1616	13.26	139.75	0.1617E-15	-15.791
900.0	1700.0	2.9044	6.5554	4.5392	6.1975	3.1498	12.45	150.92	0.1076E-15	-15.968
950.0	1700.0	2.5370	6.3717	4.2176	6.1516	3.1383	11.56	164.73	0.7273E-16	-16.138
1000.0	1700.0	2.1745	6.1904	3.9003	6.1062	3.1268	10.63	181.65	0.5036E-16	-16.301

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1650 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.9751	10.9808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	569.9	10.3247	10.5328	11.0946	7.3609		26.33	19.11	0.7751E-11	-11.111
140.0	749.1	9.7671	10.2647	10.7668	7.2574		25.87	25.64	0.3790E-11	-11.432
150.0	898.6	9.6978	10.0905	10.5212	7.1846		25.47	31.34	0.2137E-11	-11.670
160.0	1023.2	9.4789	9.9529	10.3225	7.1293		25.10	36.32	0.1376E-11	-11.861
170.0	1127.2	9.2922	9.8385	10.1538	7.0851		24.76	40.70	0.9501E-12	-12.022
180.0	1214.0	9.1274	9.7400	10.0056	7.0486		24.42	44.56	0.6885E-12	-12.162
190.0	1286.3	8.9785	9.6530	9.8721	7.0175		24.10	47.99	0.5166E-12	-12.287
200.0	1346.7	8.8415	9.5745	9.7496	6.9905		23.79	51.06	0.3980E-12	-12.400
210.0	1397.0	8.7135	9.5025	9.6356	6.9666		23.48	53.82	0.3130E-12	-12.504
220.0	1439.3	8.5925	9.4356	9.5280	6.9451		23.18	56.33	0.2502E-12	-12.602
230.0	1474.0	8.4771	9.3727	9.4257	6.9255		22.89	58.61	0.2026E-12	-12.693
240.0	1503.2	8.3662	9.3130	9.3276	6.9074		22.60	60.74	0.1659E-12	-12.780
250.0	1527.5	8.2589	9.2559	9.2328	6.8905		22.31	62.71	0.1371E-12	-12.863
260.0	1547.9	8.1547	9.2009	9.1408	6.8746		22.03	64.55	0.1142E-12	-12.943
270.0	1564.8	8.0529	9.1476	9.0511	6.8595		21.75	66.29	0.9570E-13	-13.019
280.0	1578.9	7.9532	9.0958	8.9633	6.8451		21.48	67.96	0.8069E-13	-13.093
290.0	1590.7	7.8552	9.0452	8.8772	6.8313		21.21	69.51	0.6839E-13	-13.165
300.0	1600.6	7.7588	8.9956	8.7924	6.8179		20.95	71.03	0.5823E-13	-13.235
320.0	1615.6	7.5694	8.8989	8.6261	6.7922		20.45	73.90	0.4273E-13	-13.369
340.0	1626.1	7.3838	8.8047	8.4633	6.7676		19.97	76.61	0.3179E-13	-13.498
360.0	1633.4	7.2012	8.7125	8.3032	6.7438		19.53	79.18	0.2393E-13	-13.621
380.0	1638.4	7.0209	8.6216	8.1452	6.7205		19.11	81.65	0.1821E-13	-13.740
400.0	1641.9	6.8426	8.5320	7.9889	6.6978		18.72	84.03	0.1398E-13	-13.854
420.0	1644.4	6.6658	8.4433	7.8341	6.6753		18.36	86.31	0.1083E-13	-13.966
440.0	1646.1	6.4906	8.3555	7.6806	6.6532		18.02	88.52	0.8446E-14	-14.073
460.0	1647.3	6.3166	8.2683	7.5283	6.6313		17.72	90.65	0.6636E-14	-14.178
480.0	1648.1	6.1439	8.1819	7.3770	6.6095		17.43	92.72	0.5247E-14	-14.280
500.0	1648.7	5.9723	8.0960	7.2268	6.5880	3.2996	17.17	94.73	0.4173E-14	-14.380
520.0	1649.1	5.8018	8.0107	7.0775	6.5666	3.2942	16.92	96.69	0.3337E-14	-14.477
540.0	1649.4	5.6324	7.9259	6.9292	6.5454	3.2888	16.69	98.62	0.2681E-14	-14.572
560.0	1649.6	5.4640	7.8417	6.7818	6.5243	3.2834	16.47	100.53	0.2164F-14	-14.665
580.0	1649.7	5.2966	7.7580	6.6352	6.5033	3.2781	16.26	102.44	0.1754E-14	-14.756
600.0	1649.8	5.1302	7.6748	6.4895	6.4825	3.2728	16.05	104.36	0.1427E-14	-14.846
620.0	1649.9	4.9647	7.5920	6.3446	6.4618	3.2676	15.85	106.32	0.1165E-14	-14.934
640.0	1649.9	4.8002	7.5098	6.2006	6.4412	3.2624	15.64	108.33	0.9547E-15	-15.020
660.0	1649.9	4.6367	7.4280	6.0574	6.4207	3.2572	15.44	110.41	0.7846E-15	-15.105
680.0	1649.9	4.4743	7.3467	5.9151	6.4004	3.2521	15.23	112.59	0.6468E-15	-15.189
700.0	1650.0	4.3124	7.2658	5.7735	6.3801	3.2470	15.01	114.89	0.5346E-15	-15.272
750.0	1650.0	3.9121	7.0657	5.4231	6.3301	3.2344	14.41	121.35	0.3360E-15	-15.474
800.0	1650.0	3.5175	6.8684	5.0776	6.2807	3.2220	13.72	129.19	0.2146E-15	-15.668
850.0	1650.0	3.1283	6.6738	4.7369	6.2320	3.2097	12.94	138.91	0.1393E-15	-15.856
900.0	1650.0	2.7445	6.4819	4.4009	6.1840	3.1976	12.07	151.05	0.9194F-16	-16.037
950.0	1650.0	2.3660	6.2926	4.0695	6.1366	3.1857	11.12	166.15	0.6178E-16	-16.209
1000.0	1650.0	1.9926	6.1059	3.7426	6.0899	3.1739	10.15	184.64	0.4235E-16	-16.373

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1600 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.4751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	569.2	10.1253	10.5033	11.3950	7.3612		26.33	19.09	0.7758E-11	-11.110
140.0	746.6	9.7679	10.2658	10.7676	7.2582		25.87	25.56	0.3708E-11	-11.431
150.0	893.5	9.6948	10.0923	10.5224	7.1859		25.47	31.16	0.2143E-11	-11.669
160.0	1015.0	9.4798	9.9551	10.3238	7.1311		25.10	36.04	0.1380E-11	-11.860
170.0	1115.7	9.2927	9.8410	10.1548	7.0874		24.75	40.29	0.9529E-12	-12.021
180.0	1199.0	9.1274	9.7427	10.0062	7.0512		24.41	44.04	0.6900E-12	-12.161
190.0	1268.0	8.9777	9.6557	9.8721	7.0205		24.08	47.35	0.5172E-12	-12.286
200.0	1325.2	8.8396	9.5771	9.7484	6.9937		23.77	50.29	0.4980E-12	-12.430
210.0	1372.4	8.7103	9.5048	9.6339	6.9700		23.45	52.94	0.3124E-12	-12.505
220.0	1411.6	8.5880	9.4375	9.5251	6.9486		23.15	55.35	0.2492E-12	-12.603
230.0	1444.0	8.4711	9.3741	9.4216	6.9291		22.84	57.54	0.2014E-12	-12.696
240.0	1470.9	8.3585	9.3139	9.3220	6.9111		22.55	59.56	0.1645E-12	-12.784
250.0	1493.1	8.2496	9.2561	9.2257	6.8942		22.25	61.45	0.1354E-12	-12.868
260.0	1511.5	8.1433	9.2004	9.1321	6.8783		21.97	63.21	0.1126E-12	-12.948
270.0	1526.7	8.0395	9.1463	9.0407	6.8632		21.68	64.88	0.9416E-13	-13.026
280.0	1539.3	7.9377	9.0936	8.9512	6.8487		21.40	66.46	0.7917E-13	-13.101
290.0	1549.8	7.8376	9.0421	8.8631	6.8347		21.13	67.98	0.6691E-13	-13.175
300.0	1558.4	7.7389	8.9915	8.7764	6.8211		20.87	69.44	0.5680E-13	-13.246
320.0	1571.5	7.5448	8.8926	8.6061	6.7951		20.35	72.22	0.4143E-13	-13.383
340.0	1580.5	7.3544	8.7962	8.4390	6.7700		19.87	74.85	0.3064E-13	-13.514
360.0	1586.6	7.1667	8.7015	8.2745	6.7457		19.41	77.36	0.2293E-13	-13.640
380.0	1590.8	6.9813	8.6082	8.1121	6.7219		18.99	79.76	0.1734E-13	-13.761
400.0	1593.7	6.7978	8.5161	7.9513	6.6986		18.60	82.08	0.1324E-13	-13.878
420.0	1595.7	6.6158	8.4248	7.7919	6.6755		18.24	84.31	0.1020E-13	-13.992
440.0	1597.0	6.4353	8.3344	7.6338	6.6528		17.90	86.46	0.7914E-14	-14.102
460.0	1598.0	6.2560	8.2446	7.4769	6.6302		17.60	88.54	0.6185E-14	-14.209
480.0	1598.6	6.0780	8.1555	7.3210	6.6079		17.31	90.56	0.4865E-14	-14.313
500.0	1599.0	5.9012	8.0673	7.1662	6.5857	3.3539	17.05	92.52	0.3850E-14	-14.415
520.0	1599.3	5.7254	7.9791	7.0123	6.5636	3.3482	16.80	94.44	0.3063E-14	-14.514
540.0	1599.6	5.5507	7.8918	6.8593	6.5418	3.3427	16.57	96.33	0.2449E-14	-14.611
560.0	1599.7	5.3771	7.8049	6.7073	6.5200	3.3372	16.35	98.22	0.1967E-14	-14.706
580.0	1599.8	5.2045	7.7186	6.5562	6.4984	3.3317	16.13	100.10	0.1587E-14	-14.800
600.0	1599.9	5.0328	7.6328	6.4059	6.4769	3.3263	15.92	102.00	0.1285E-14	-14.891
620.0	1599.9	4.8622	7.5475	6.2566	6.4556	3.3209	15.71	103.98	0.1044E-14	-14.981
640.0	1599.9	4.6926	7.4626	6.1081	6.4343	3.3156	15.50	106.03	0.8512E-15	-15.070
660.0	1600.0	4.5239	7.3783	5.9604	6.4132	3.3102	15.29	108.13	0.6963E-15	-15.157
680.0	1600.0	4.3562	7.2945	5.8136	6.3922	3.3050	15.06	110.36	0.5712E-15	-15.243
700.0	1600.0	4.1895	7.2111	5.6676	6.3714	3.2997	14.83	112.75	0.4700E-15	-15.328
750.0	1600.0	3.7768	7.0047	5.3069	6.3197	3.2867	14.18	119.55	0.2922E-15	-15.534
800.0	1600.0	3.3698	6.8012	4.9500	6.2688	3.2739	13.44	127.94	0.1847E-15	-15.734
850.0	1600.0	2.9685	6.6006	4.5986	6.2186	3.2612	12.59	138.49	0.1188E-15	-15.925
900.0	1600.0	2.5727	6.4027	4.2521	6.1691	3.2488	11.65	151.78	0.7781E-16	-16.109
950.0	1600.0	2.1823	6.2075	3.9104	6.1202	3.2365	10.65	168.35	0.5199E-16	-16.284
1000.0	1600.0	1.7972	6.0150	3.5733	6.0721	3.2243	9.63	188.60	0.3552E-16	-16.449

TABLE I.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1550 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8838	11.6221	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	548.3	10.3255	10.5239	11.0955	7.3616		26.33	19.56	0.7768E-11	-11.110
140.0	743.5	9.8698	10.2672	10.7697	7.2592		25.87	25.45	0.3717E-11	-11.430
150.0	887.4	9.6008	10.0942	10.5236	7.1875		25.46	30.06	0.2153E-11	-11.668
160.0	1035.7	9.4856	9.9573	10.3243	7.1332		25.29	35.72	0.1385E-11	-11.859
170.0	1132.8	9.2933	9.8436	10.1557	7.0869		24.74	39.85	0.9554E-12	-12.020
180.0	1182.7	9.1263	9.7454	10.0265	7.0541		24.33	43.46	0.6912E-12	-12.160
190.0	1248.2	8.9767	9.6583	9.9116	7.0237		24.36	46.65	0.5174E-12	-12.286
200.0	1332.1	8.8367	9.5795	9.7474	6.9971		23.74	49.68	0.3975E-12	-12.401
210.0	1366.3	8.7062	9.5069	9.6312	6.9736		23.42	52.31	0.3114E-12	-12.507
220.0	1382.7	8.5823	9.4392	9.5213	6.9524		23.11	54.33	0.2479E-12	-12.606
230.0	1412.5	8.4636	9.3752	9.4168	6.9330		22.80	56.43	0.1998E-12	-12.699
240.0	1437.1	8.3492	9.3143	9.3171	6.9149		22.49	58.34	0.1628E-12	-12.788
250.0	1457.7	8.2382	9.2557	9.2172	6.8980		22.19	60.14	0.1338E-12	-12.874
260.0	1473.8	8.1299	9.1991	9.1218	6.8821		21.90	61.84	0.1108E-12	-12.955
270.0	1487.4	8.0239	9.1441	9.0285	6.8668		21.61	63.43	0.9235E-13	-13.035
280.0	1498.6	7.9198	9.0904	8.9369	6.8522		21.32	64.95	0.7740E-13	-13.111
290.0	1507.7	7.8172	9.0378	8.8468	6.8382		21.04	66.42	0.6521E-13	-13.186
300.0	1515.3	7.7165	8.9862	8.7579	6.8243		20.77	67.83	0.5518E-13	-13.258
320.0	1526.6	7.5169	8.8850	8.5832	6.7978		20.25	70.52	0.3979E-13	-13.398
340.0	1534.2	7.3212	8.7862	8.4118	6.7722		19.75	73.09	0.2938E-13	-13.532
360.0	1539.3	7.1281	8.6889	8.2423	6.7474		19.29	75.57	0.2195E-13	-13.660
380.0	1542.8	6.9371	8.5928	8.0751	6.7230		18.87	77.97	0.1643E-13	-13.784
400.0	1545.1	6.7483	8.4979	7.9094	6.6990		18.47	80.12	0.1247E-13	-13.904
420.0	1546.7	6.5604	8.4039	7.7451	6.6753		18.11	82.30	0.9544E-14	-14.020
440.0	1547.8	6.3742	8.3107	7.5821	6.6519		17.78	84.47	0.7365E-14	-14.133
460.0	1548.5	6.1893	8.2181	7.4202	6.6286		17.47	86.43	0.5724E-14	-14.242
480.0	1549.0	6.0057	8.1262	7.2594	6.6056		17.19	88.33	0.4478E-14	-14.349
500.0	1549.3	5.8232	8.0349	7.0996	6.5827	3.4119	16.92	90.31	0.3525E-14	-14.453
520.0	1549.5	5.6418	7.9442	6.9408	6.5600	3.4062	16.68	92.19	0.2789E-14	-14.554
540.0	1549.7	5.4615	7.8540	6.7829	6.5374	3.4014	16.44	94.05	0.2219E-14	-14.654
560.0	1549.8	5.2823	7.7644	6.6260	6.5150	3.3968	16.22	95.97	0.1773E-14	-14.751
580.0	1549.9	5.1041	7.6753	6.4701	6.4927	3.3891	16.00	97.78	0.1423E-14	-14.847
600.0	1549.9	4.9270	7.5867	6.3150	6.4705	3.3836	15.79	99.69	0.1146E-14	-14.941
620.0	1549.9	4.7509	7.4987	6.1608	6.4484	3.3780	15.57	101.67	0.9265E-15	-15.033
640.0	1550.0	4.5758	7.4111	6.0075	6.4265	3.3725	15.35	103.73	0.7517E-15	-15.124
660.0	1550.0	4.4017	7.3241	5.8551	6.4047	3.3670	15.12	105.91	0.6118E-15	-15.213
680.0	1550.0	4.2286	7.2375	5.7035	6.3831	3.3615	14.88	108.23	0.4995E-15	-15.301
700.0	1550.0	4.0565	7.1515	5.5529	6.3616	3.3561	14.63	110.72	0.4090E-15	-15.388
750.0	1550.0	3.6334	6.9384	5.1799	6.3092	3.3427	13.93	117.94	0.2513E-15	-15.600
800.0	1550.0	3.2133	6.7284	4.8121	6.2557	3.3294	13.11	127.02	0.1572E-15	-15.803
850.0	1550.0	2.7963	6.5213	4.4494	6.2038	3.3164	12.19	138.57	0.1002E-15	-15.999
900.0	1550.0	2.3825	6.3170	4.0917	6.1527	3.3035	11.18	153.21	0.6516E-16	-16.186
950.0	1550.0	1.9745	6.1155	3.7389	6.1023	3.2908	10.13	171.48	0.4334E-16	-16.363
1000.0	1550.0	1.5870	5.9167	3.3909	6.0526	3.2783	9.09	193.67	0.2955E-16	-16.529

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1500 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	566.9	10.3262	10.5048	11.0963	7.3622		26.33	19.01	0.7781E-11	-11.109
140.0	739.6	9.9698	10.2688	10.7698	7.2605		25.87	25.32	0.3727E-11	-11.429
150.0	880.4	9.7008	10.0965	10.5249	7.1854		25.46	30.72	0.2156E-11	-11.666
160.0	995.0	9.4812	9.9601	10.3260	7.1356		25.08	35.35	0.1389E-11	-11.857
170.0	1088.5	9.2928	9.8464	10.1563	7.0927		24.72	39.35	0.9574E-12	-12.019
180.0	1164.7	9.1257	9.7482	10.0063	7.0573		24.37	42.84	0.6918E-12	-12.160
190.0	1226.7	8.9738	9.6609	9.8705	7.0271		24.04	45.89	0.5170E-12	-12.286
200.0	1277.3	8.8331	9.5818	9.7451	7.0038		23.71	48.60	0.3963E-12	-12.402
210.0	1318.5	8.7038	9.5088	9.6276	6.9774		23.38	51.03	0.3098E-12	-12.509
220.0	1352.1	8.5751	9.4404	9.5162	6.9563		23.06	53.22	0.2460E-12	-12.609
230.0	1379.5	8.4545	9.3758	9.4095	6.9369		22.74	55.22	0.1977E-12	-12.704
240.0	1401.8	8.3379	9.3140	9.3066	6.9189		22.43	57.57	0.1606E-12	-12.794
250.0	1420.0	8.2246	9.2546	9.2067	6.9019		22.12	58.79	0.1316E-12	-12.881
260.0	1434.8	8.1140	9.1970	9.1093	6.8858		21.82	60.41	0.1086E-12	-12.964
270.0	1446.9	8.0055	9.1409	9.0139	6.8705		21.52	61.95	0.9021E-13	-13.045
280.0	1456.7	7.8988	9.0861	8.9201	6.8557		21.23	63.41	0.7535E-13	-13.123
290.0	1464.7	7.7937	9.0324	8.8277	6.8413		20.94	64.83	0.6326E-13	-13.199
300.0	1471.2	7.6898	8.9794	8.7365	6.8274		20.67	66.19	0.5334E-13	-13.273
320.0	1480.9	7.4850	8.8757	8.5570	6.8003		20.13	68.80	0.3839E-13	-13.416
340.0	1487.3	7.2836	8.7740	8.3803	6.7742		19.63	71.29	0.2801E-13	-13.553
360.0	1491.6	7.0846	8.6739	8.2060	6.7487		19.16	73.67	0.2069E-13	-13.684
380.0	1494.4	6.8877	8.5750	8.0335	6.7237		18.73	75.96	0.1545E-13	-13.811
400.0	1496.3	6.6925	8.4772	7.8626	6.6990		18.34	78.17	0.1166E-13	-13.933
420.0	1497.5	6.4989	8.3802	7.6930	6.6746		17.97	80.29	0.8868E-14	-14.052
440.0	1498.4	6.3067	8.2839	7.5247	6.6504		17.64	82.33	0.6802E-14	-14.167
460.0	1498.9	6.1157	8.1884	7.3575	6.6264		17.33	84.30	0.5256E-14	-14.279
480.0	1499.3	5.9260	8.0935	7.1914	6.6026		17.05	86.22	0.4089E-14	-14.388
500.0	1499.5	5.7375	7.9992	7.0263	6.5790	3.4742	16.79	88.09	3.3200E-14	-14.495
520.0	1499.7	5.5501	7.9054	6.8623	6.5555	3.4682	16.55	89.93	0.2518E-14	-14.599
540.0	1499.8	5.3638	7.8123	6.6992	6.5322	3.4623	16.31	91.76	0.1992E-14	-14.701
560.0	1499.9	5.1786	7.7197	6.5371	6.5090	3.4565	16.08	93.60	0.1583E-14	-14.801
580.0	1499.9	4.9945	7.6276	6.3759	6.4860	3.4507	15.86	95.47	0.1263E-14	-14.899
600.0	1499.9	4.8115	7.5361	6.2157	6.4631	3.4449	15.64	97.40	0.1012E-14	-14.995
620.0	1500.0	4.6295	7.4451	6.0563	6.4403	3.4392	15.41	99.40	0.8139E-15	-15.089
640.0	1500.0	4.4486	7.3547	5.8979	6.4177	3.4335	15.18	101.52	0.6568E-15	-15.183
660.0	1500.0	4.2687	7.2647	5.7405	6.3952	3.4278	14.93	103.78	0.5318E-15	-15.274
680.0	1500.0	4.0898	7.1753	5.5839	6.3728	3.4221	14.67	106.21	0.4319E-15	-15.365
700.0	1500.0	3.9120	7.0863	5.4282	6.3505	3.4165	14.40	108.85	0.3519E-15	-15.454
750.0	1500.0	3.4717	6.8662	5.0427	6.2954	3.4027	13.63	116.60	0.2136E-15	-15.670
800.0	1500.0	3.0376	6.6492	4.6627	6.2411	3.3890	12.74	126.52	0.1322E-15	-15.879
850.0	1500.0	2.6096	6.4351	4.2879	6.1876	3.3755	11.74	139.27	0.8352E-16	-16.078
900.0	1500.0	2.1874	6.2240	3.9183	6.1347	3.3622	10.66	155.51	0.5396E-16	-16.268
950.0	1500.0	1.7710	6.0158	3.5538	6.0826	3.3491	9.56	175.70	0.3577E-16	-16.447
1000.0	1500.0	1.3602	5.8105	3.1942	6.0312	3.3361	8.52	199.97	0.2439E-16	-16.613

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1450 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	565.1	10.3271	10.5059	11.0972	7.3630		26.33	18.95	0.7799E-11	-11.108
140.0	734.8	9.9709	10.2708	10.7712	7.2620		25.86	25.16	0.3739E-11	-11.427
150.0	872.0	9.7017	10.0990	10.5262	7.1915		25.45	30.44	0.2163E-11	-11.665
160.0	982.9	9.4814	9.9629	10.3269	7.1382		25.07	34.94	0.1392E-11	-11.856
170.0	1072.5	9.2921	9.8493	10.1565	7.0958		24.70	38.80	0.9588E-12	-12.018
180.0	1144.9	9.1238	9.7509	10.0056	7.0607		24.35	42.15	0.6916E-12	-12.160
190.0	1203.4	8.9705	9.6634	9.8686	7.0308		24.01	45.08	0.5158E-12	-12.288
200.0	1253.7	8.8280	9.5838	9.7418	7.0047		23.67	47.67	0.3944E-12	-12.404
210.0	1289.0	8.6939	9.5102	9.6228	6.9814		23.33	49.98	0.3075E-12	-12.512
220.0	1319.9	8.5661	9.4412	9.5096	6.9603		23.00	52.07	0.2434E-12	-12.614
230.0	1344.8	8.4432	9.3757	9.4010	6.9409		22.68	53.98	0.1950E-12	-12.710
240.0	1365.0	8.3242	9.3130	9.2961	6.9229		22.36	55.75	0.1578E-12	-12.802
250.0	1381.3	8.2084	9.2525	9.1940	6.9058		22.04	57.40	0.1289E-12	-12.890
260.0	1394.5	8.0952	9.1938	9.0943	6.8896		21.73	58.95	0.1060E-12	-12.975
270.0	1405.1	7.9840	9.1365	8.9966	6.8741		21.42	60.43	0.8770E-13	-13.057
280.0	1413.7	7.8745	9.0804	8.9004	6.8590		21.13	61.85	0.7298E-13	-13.137
290.0	1420.7	7.7664	9.0253	8.8055	6.8445		20.83	63.21	0.6103E-13	-13.214
300.0	1426.3	7.6595	8.9710	8.7117	6.8302		20.55	64.53	0.5127E-13	-13.290
320.0	1434.5	7.4487	8.8644	8.5268	6.8026		20.00	67.07	0.3662E-13	-13.436
340.0	1439.9	7.2410	8.7597	8.3468	6.7758		19.50	69.50	0.2653E-13	-13.576
360.0	1443.4	7.0356	8.6565	8.1649	6.7496		19.02	71.82	0.1946E-13	-13.711
380.0	1445.7	6.8323	8.5545	7.9868	6.7238		18.59	74.06	0.1443E-13	-13.841
400.0	1447.2	6.6306	8.4535	7.8102	6.6984		18.19	76.20	0.1081E-13	-13.966
420.0	1448.2	6.4305	8.3532	7.6349	6.6732		17.83	78.27	0.8173E-14	-14.088
440.0	1448.8	6.2317	8.2538	7.4609	6.6482		17.50	80.25	0.6230E-14	-14.206
460.0	1449.2	6.0343	8.1550	7.2880	6.6235		17.19	82.18	0.4784E-14	-14.320
480.0	1449.5	5.8381	8.0568	7.1163	6.5989		16.91	84.04	0.3699E-14	-14.432
500.0	1449.7	5.6431	7.9593	6.9455	6.5745	3.5409	16.65	85.87	0.2878E-14	-14.541
520.0	1449.8	5.4493	7.8624	6.7758	6.5502	3.5348	16.41	87.68	0.2251E-14	-14.648
540.0	1449.9	5.2566	7.7660	6.6072	6.5261	3.5287	16.17	89.49	0.1770E-14	-14.752
560.0	1449.9	5.0650	7.6702	6.4395	6.5021	3.5226	15.94	91.31	0.1399E-14	-14.854
580.0	1449.9	4.8746	7.5750	6.2727	6.4783	3.5166	15.71	93.19	0.1110E-14	-14.955
600.0	1450.0	4.6853	7.4804	6.1070	6.4546	3.5107	15.47	95.14	0.8840E-15	-15.054
620.0	1450.0	4.4970	7.3862	5.9422	6.4310	3.5047	15.23	97.20	0.7068E-15	-15.151
640.0	1450.0	4.3099	7.2927	5.7783	6.4076	3.4988	14.98	99.40	0.5672E-15	-15.246
660.0	1450.0	4.1238	7.1996	5.6154	6.3843	3.4930	14.72	101.77	0.4567E-15	-15.340
680.0	1450.0	3.9387	7.1071	5.4534	6.3612	3.4871	14.44	104.34	0.3689E-15	-15.433
700.0	1450.0	3.7548	7.0151	5.2923	6.3381	3.4813	14.14	107.17	0.2990E-15	-15.524
750.0	1450.0	3.2993	6.7874	4.8936	6.2812	3.4670	13.29	115.59	0.1793E-15	-15.746
800.0	1450.0	2.8503	6.5628	4.5055	6.2250	3.4528	12.31	126.54	0.1098E-15	-15.960
850.0	1450.0	2.4074	6.3414	4.1278	6.1696	3.4389	11.23	140.75	0.6875E-16	-16.163
900.0	1450.0	1.9707	6.1231	3.7604	6.1145	3.4251	10.09	158.84	0.4419E-16	-16.355
950.0	1450.0	1.5399	5.9077	3.3933	6.0610	3.4116	8.97	181.16	0.2924E-16	-16.534
1000.0	1450.0	1.1150	5.6952	2.9813	6.0078	3.3982	7.93	207.55	0.1999E-16	-16.699

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1400 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.4751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	562.6	10.3283	10.5074	11.0985	7.3641		26.33	18.87	0.7822E-11	-11.107
140.0	723.0	9.9722	10.2731	10.7727	7.2639		25.86	24.96	0.3753E-11	-11.426
150.0	862.3	9.7225	10.1018	10.5275	7.1940		25.44	30.11	0.2171E-11	-11.663
160.0	984.1	9.4913	9.9659	10.3276	7.1413		25.05	34.47	0.1396E-11	-11.855
170.0	1054.7	9.2308	9.8522	10.1562	7.0992		24.68	38.19	0.9594E-12	-12.018
180.0	1123.3	9.1213	9.7536	10.0041	7.0644		24.32	41.41	0.6905E-12	-12.161
190.0	1178.3	8.9658	9.6657	9.8657	7.0348		23.97	44.21	0.5134E-12	-12.289
200.0	1222.3	8.8214	9.5855	9.7373	7.0088		23.62	46.68	0.3916E-12	-12.407
210.0	1257.6	8.6850	9.5111	9.6184	6.9856		23.28	48.89	0.3043E-12	-12.517
220.0	1285.9	8.5548	9.4412	9.5082	6.9645		22.94	50.87	0.2403E-12	-12.620
230.0	1308.6	8.4294	9.3747	9.3994	6.9451		22.61	52.69	0.1914E-12	-12.718
240.0	1326.7	8.3078	9.3109	9.2892	6.9269		22.28	54.38	0.1540E-12	-12.811
250.0	1341.3	8.1891	9.2492	9.1787	6.9097		21.95	55.96	0.1256E-12	-12.901
260.0	1353.0	8.0729	9.1892	9.0765	6.8933		21.63	57.46	0.1029E-12	-12.988
270.0	1362.3	7.9587	9.1306	8.9761	6.8775		21.32	58.88	0.8479E-13	-13.072
280.0	1369.8	7.8463	9.0731	8.8772	6.8623		21.01	60.25	0.7027E-13	-13.153
290.0	1375.8	7.7349	9.0165	8.7796	6.8474		20.71	61.58	0.5843E-13	-13.233
300.0	1380.6	7.6246	8.9607	8.6833	6.8329		20.42	62.86	0.4887E-13	-13.310
320.0	1387.5	7.4272	8.8509	8.4923	6.8046		19.86	65.34	0.3469E-13	-13.460
340.0	1392.2	7.1926	8.7429	8.3043	6.7771		19.35	67.70	0.2494E-13	-13.603
360.0	1395.7	6.9804	8.6363	8.1186	6.7501		18.87	69.97	0.1815E-13	-13.741
380.0	1396.7	6.7701	8.5309	7.9342	6.7235		18.43	72.14	0.1337E-13	-13.874
400.0	1397.9	6.5614	8.4264	7.7515	6.6972		18.04	74.23	0.9942E-14	-14.003
420.0	1398.6	6.3543	8.3227	7.5701	6.6711		17.68	76.24	0.7465E-14	-14.127
440.0	1399.1	6.1485	8.2197	7.3899	6.6453		17.35	78.18	0.5652E-14	-14.248
460.0	1399.4	5.9441	8.1175	7.2110	6.6197		17.05	80.04	0.4312E-14	-14.365
480.0	1399.6	5.7409	8.0159	7.0331	6.5942		16.77	81.86	0.3313E-14	-14.480
500.0	1399.8	5.5390	7.9149	6.8563	6.5690	3.6126	16.51	83.65	0.2561E-14	-14.592
520.0	1399.9	5.3383	7.8145	6.6806	6.5438	3.6262	16.26	85.43	0.1991E-14	-14.701
540.0	1399.9	5.1387	7.7147	6.5059	6.5188	3.5999	16.02	87.22	0.1556E-14	-14.808
560.0	1399.9	4.9403	7.6155	6.3322	6.4940	3.5937	15.78	89.05	0.1221E-14	-14.913
580.0	1400.0	4.7431	7.5169	6.1595	6.4693	3.5874	15.54	90.95	0.9631E-15	-15.016
600.0	1400.0	4.5470	7.4188	5.9878	6.4448	3.5813	15.29	92.95	0.7625E-15	-15.118
620.0	1400.0	4.3521	7.3214	5.8172	6.4204	3.5751	15.04	95.09	0.6060E-15	-15.218
640.0	1400.0	4.1582	7.2244	5.6475	6.3962	3.5690	14.76	97.33	0.4836E-15	-15.316
660.0	1400.0	3.9655	7.1281	5.4787	6.3720	3.5629	14.48	99.91	0.3869E-15	-15.412
680.0	1400.0	3.7738	7.0322	5.3109	6.3481	3.5569	14.17	102.68	0.3108E-15	-15.508
700.0	1400.0	3.5833	6.9370	5.1441	6.3242	3.5509	13.83	135.74	0.2505E-15	-15.601
750.0	1400.0	3.1116	6.7011	4.7312	6.2652	3.5360	12.90	115.02	0.1483E-15	-15.829
800.0	1400.0	2.6665	6.4686	4.3240	6.2070	3.5214	11.82	127.24	0.8986E-16	-16.046
850.0	1400.0	2.1878	6.2392	3.9224	6.1496	3.5069	10.66	143.17	0.5587E-16	-16.253
900.0	1400.0	1.7355	6.0131	3.5264	6.0930	3.4927	9.47	163.38	0.3578E-16	-16.446
950.0	1400.0	1.2894	5.7900	3.1358	6.0372	3.4786	8.34	187.98	0.2369E-16	-16.625
1000.0	1400.0	0.8493	5.5700	2.7506	5.9821	3.4648	7.35	216.39	0.1628E-16	-16.788

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1350 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	559.5	10.3298	10.5094	11.1001	7.3655		26.32	18.76	0.7851E-11	-11.105
140.0	721.9	9.9736	10.2759	10.7745	7.2661		25.85	24.73	0.3769E-11	-11.424
150.0	851.0	9.7031	10.1050	10.5288	7.1969		25.43	29.72	0.2178E-11	-11.662
160.0	953.5	9.4807	9.9691	10.3279	7.1447		25.04	33.94	0.1398E-11	-11.855
170.0	1035.0	9.2887	9.8553	10.1553	7.1030		24.66	37.52	0.9589E-12	-12.018
180.0	1099.7	9.1170	9.7562	10.0018	7.0685		24.29	40.59	0.6882E-12	-12.162
190.0	1151.2	8.9597	9.6677	9.8616	7.0390		23.93	43.27	0.5103E-12	-12.292
200.0	1192.0	8.8129	9.5867	9.7312	7.0131		23.57	45.62	0.3877E-12	-12.412
210.0	1224.5	8.6740	9.5114	9.6081	6.9900		23.22	47.72	0.3001E-12	-12.523
220.0	1250.3	8.5410	9.4404	9.4906	6.9689		22.87	49.62	0.2357E-12	-12.628
230.0	1270.8	8.4127	9.3727	9.3774	6.9493		22.52	51.36	0.1874E-12	-12.727
240.0	1287.1	8.2880	9.3076	9.2675	6.9310		22.18	52.98	0.1504E-12	-12.823
250.0	1300.0	8.1662	9.2445	9.1603	6.9136		21.85	54.50	0.1218E-12	-12.914
260.0	1310.3	8.0467	9.1831	9.0553	6.8969		21.52	55.94	0.9929E-13	-13.003
270.0	1318.4	7.9291	9.1229	8.9520	6.8809		21.19	57.32	0.8146E-13	-13.089
280.0	1324.9	7.8130	9.0638	8.8501	6.8653		20.88	58.64	0.6721E-13	-13.173
290.0	1330.1	7.6982	9.0056	8.7496	6.8501		20.57	59.93	0.5573E-13	-13.254
300.0	1334.2	7.5845	8.9480	8.6497	6.8352		20.28	61.18	0.4642E-13	-13.333
320.0	1340.0	7.3597	8.8347	8.4527	6.8062		19.71	63.59	0.3261E-13	-13.487
340.0	1343.7	7.1378	8.7231	8.2582	6.7778		19.19	65.90	0.2324E-13	-13.634
360.0	1346.0	6.9180	8.6129	8.0657	6.7495		18.71	68.11	0.1678E-13	-13.775
380.0	1347.5	6.7002	8.5037	7.8749	6.7214		18.27	70.23	0.1226E-13	-13.911
400.0	1348.4	6.4840	8.3955	7.6856	6.6932		17.87	72.26	0.9054E-14	-14.043
420.0	1349.0	6.2693	8.2880	7.4976	6.6683		17.52	74.21	0.6749E-14	-14.171
440.0	1349.4	6.0560	8.1813	7.3109	6.6415		17.19	76.09	0.5074E-14	-14.295
460.0	1349.6	5.8440	8.0753	7.1253	6.6150		16.89	77.91	0.3865E-14	-14.415
480.0	1349.7	5.6334	7.9700	6.9409	6.5886		16.61	79.68	0.2934E-14	-14.533
500.0	1349.8	5.4240	7.8653	6.7576	6.5624	3.6895	16.35	81.43	0.2253E-14	-14.647
520.0	1349.9	5.2159	7.7612	6.5754	6.5363	3.6830	16.10	83.19	0.1739E-14	-14.760
540.0	1349.9	5.0089	7.6577	6.3942	6.5104	3.6764	15.85	84.98	0.1350E-14	-14.870
560.0	1350.0	4.8032	7.5548	6.2141	6.4847	3.6700	15.61	86.83	0.1053E-14	-14.978
580.0	1350.0	4.5987	7.4526	6.0350	6.4591	3.6635	15.35	88.77	0.8248E-15	-15.084
600.0	1350.0	4.3953	7.3509	5.8570	6.4336	3.6571	15.09	90.85	0.6488E-15	-15.188
620.0	1350.0	4.1931	7.2498	5.6800	6.4083	3.6507	14.81	93.09	0.5123E-15	-15.290
640.0	1350.0	3.9921	7.1493	5.5040	6.3832	3.6444	14.51	95.55	0.4061E-15	-15.391
660.0	1350.0	3.7922	7.0494	5.3290	6.3582	3.6381	14.19	98.26	0.3231E-15	-15.491
680.0	1350.0	3.5935	6.9500	5.1550	6.3333	3.6318	13.85	101.27	0.2579E-15	-15.588
700.0	1350.0	3.3959	6.8512	4.9820	6.3086	3.6256	13.48	104.65	0.2067E-15	-15.685
750.0	1350.0	2.9067	6.6066	4.5538	6.2474	3.6102	12.44	114.99	0.1208E-15	-15.918
800.0	1350.0	2.4244	6.3654	4.1315	6.1870	3.5950	11.27	128.77	0.7250E-16	-16.140
850.0	1350.0	1.9488	6.1276	3.7151	6.1275	3.5800	10.03	146.74	0.4481E-16	-16.349
900.0	1350.0	1.4797	5.8931	3.3044	6.0688	3.5652	8.81	169.31	0.2866E-16	-16.543
950.0	1350.0	1.0170	5.6617	2.8994	6.0109	3.5507	7.71	196.23	0.1905E-16	-16.720
1000.0	1350.0	0.5606	5.4335	2.4998	5.9538	3.5363	6.77	226.31	0.1321E-16	-16.879

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1300 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	555.6	10.3316	10.5118	11.1020	7.3672		26.32	18.63	0.7887E-11	-11.103
140.0	713.5	9.9751	10.2792	10.7766	7.2668		25.85	24.45	0.3787E-11	-11.422
150.0	838.0	9.7035	10.1085	10.5259	7.2003		25.42	29.29	0.2186E-11	-11.660
160.0	936.1	9.4795	9.9725	10.3279	7.1485		25.01	33.34	0.1399E-11	-11.854
170.0	1013.3	9.2855	9.8583	10.1537	7.1072		24.63	36.78	0.9570E-12	-12.019
180.0	1074.1	9.1116	9.7586	9.9983	7.0729		24.25	39.72	0.6845E-12	-12.165
190.0	1122.1	8.9517	9.6693	9.8560	7.0435		23.87	42.26	0.5056E-12	-12.296
200.0	1159.8	8.8022	9.5873	9.7233	7.0177		23.51	44.51	0.3825E-12	-12.417
210.0	1189.6	8.6603	9.5109	9.5977	6.9945		23.14	46.51	0.2947E-12	-12.531
220.0	1213.0	8.5242	9.4386	9.4775	6.9733		22.78	48.32	0.2304E-12	-12.637
230.0	1231.5	8.3926	9.3695	9.3615	6.9535		22.43	49.99	0.1823E-12	-12.739
240.0	1246.0	8.2645	9.3029	9.2486	6.9350		22.07	51.54	0.1456E-12	-12.837
250.0	1257.5	8.1391	9.2382	9.1384	6.9173		21.73	53.00	0.1173E-12	-12.931
260.0	1266.5	8.0159	9.1751	9.0302	6.9004		21.39	54.39	0.9518E-13	-13.021
270.0	1273.6	7.8946	9.1132	8.9236	6.8840		21.06	55.73	0.7771E-13	-13.110
280.0	1279.2	7.7747	9.0523	8.8185	6.8681		20.73	57.02	0.6380E-13	-13.195
290.0	1283.6	7.6560	8.9922	8.7144	6.8525		20.42	58.27	0.5264E-13	-13.279
300.0	1287.1	7.5384	8.9328	8.6112	6.8372		20.12	59.49	0.4364E-13	-13.360
320.0	1292.0	7.3056	8.8156	8.4073	6.8072		19.54	61.84	0.3037E-13	-13.518
340.0	1295.0	7.0756	8.7001	8.2058	6.7779		19.01	64.09	0.2146E-13	-13.668
360.0	1296.9	6.8477	8.5858	8.0062	6.7491		18.53	66.25	0.1537E-13	-13.813
380.0	1298.1	6.6217	8.4726	7.8083	6.7206		18.09	68.31	0.1114E-13	-13.953
400.0	1298.8	6.3973	8.3603	7.6118	6.6924		17.70	70.28	0.8158E-14	-14.088
420.0	1299.3	6.1745	8.2488	7.4167	6.6645		17.35	72.17	0.6035E-14	-14.219
440.0	1299.5	5.9530	8.1380	7.2228	6.6367		17.02	73.99	0.4534E-14	-14.344
460.0	1299.7	5.7330	8.0280	7.0301	6.6092		16.73	75.76	0.3388E-14	-14.470
480.0	1299.8	5.5143	7.9186	6.8386	6.5818		16.45	77.50	0.2566E-14	-14.591
500.0	1299.9	5.2968	7.8099	6.6483	6.5546	3.7724	16.19	79.22	0.1956E-14	-14.709
520.0	1299.9	5.0807	7.7018	6.4591	6.5275	3.7655	15.93	80.97	0.1503E-14	-14.824
540.0	1300.0	4.8658	7.5943	6.2709	6.5006	3.7588	15.67	82.77	0.1156E-14	-14.937
560.0	1300.0	4.6522	7.4875	6.0839	6.4739	3.7520	15.41	84.66	0.8949E-15	-15.048
580.0	1300.0	4.4398	7.3813	5.8980	6.4473	3.7453	15.14	86.67	0.6961E-15	-15.157
600.0	1300.0	4.2286	7.2757	5.7131	6.4209	3.7387	14.86	88.86	0.5437E-15	-15.265
620.0	1300.0	4.0187	7.1708	5.5293	6.3946	3.7321	14.55	91.25	0.4264E-15	-15.370
640.0	1300.0	3.8099	7.0664	5.3465	6.3685	3.7255	14.22	93.91	0.3357E-15	-15.474
660.0	1300.0	3.6023	6.9626	5.1648	6.3425	3.7189	13.86	96.88	0.2654E-15	-15.576
680.0	1300.0	3.3960	6.8594	4.9841	6.3167	3.7124	13.48	100.22	0.2106E-15	-15.677
700.0	1300.0	3.1907	6.7568	4.8045	6.2910	3.7060	13.06	103.99	0.1678E-15	-15.775
750.0	1300.0	2.6828	6.5028	4.3597	6.2275	3.6900	11.91	115.68	0.9688E-16	-16.014
800.0	1300.0	2.1819	6.2524	3.9212	6.1648	3.6742	10.64	131.35	0.5762E-16	-16.239
850.0	1300.0	1.6879	6.0054	3.4888	6.1030	3.6586	9.34	151.68	0.3548E-16	-16.450
900.0	1300.0	1.2008	5.7618	3.0623	6.0421	3.6433	8.13	176.75	0.2274E-16	-16.643
950.0	1300.0	0.7204	5.5216	2.6417	5.9819	3.6281	7.08	205.74	0.1523E-16	-16.817
1000.0	1300.0	0.2464	5.2846	2.2268	5.9226	3.6132	6.23	236.91	0.1069E-16	-16.971

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperatnre—Continued

EXOSPHERIC TEMPERATURE = 1250 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(M2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	13.8751	13.9808	11.6221	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	553.8	13.3347	13.5145	11.1044	7.3654		26.32	18.48	0.7930E-11	-11.101
140.0	733.9	12.9767	13.2830	10.7786	7.2720		25.94	24.12	0.3807E-11	-11.419
150.0	823.3	12.7046	13.1124	10.5310	7.2041		25.40	28.79	0.2193E-11	-11.659
160.0	916.6	12.4776	12.9761	10.3274	7.1528		24.99	32.69	0.1400E-11	-11.854
170.0	989.6	12.2812	12.8613	10.1512	7.1117		24.59	35.97	0.9535E-12	-12.021
180.0	1046.5	12.1045	12.7608	9.9935	7.0774		24.23	38.77	0.6791E-12	-12.168
190.0	1091.1	11.9417	12.6723	9.8497	7.0483		23.92	41.25	0.4992E-12	-12.302
200.0	1126.8	11.7889	12.5871	9.7139	7.0224		23.63	43.33	0.3758E-12	-12.425
210.0	1154.0	11.6436	12.5093	9.5848	6.9991		23.36	45.24	0.2881E-12	-12.540
220.0	1174.2	11.5039	12.4355	9.4615	6.9777		23.08	46.99	0.2241E-12	-12.650
230.0	1189.0	11.3686	12.3648	9.3428	6.9578		22.82	48.57	0.1763E-12	-12.754
240.0	1199.7	11.2366	12.2964	9.2281	6.9389		21.75	50.37	0.1401E-12	-12.854
250.0	1213.9	11.1073	12.2299	9.1124	6.9209		21.60	51.48	0.1122E-12	-12.950
260.0	1221.8	10.9800	12.1649	9.0037	6.9036		21.25	52.93	0.9055E-13	-13.043
270.0	1227.9	10.8545	12.1011	8.8906	6.8868		20.90	54.12	0.7353E-13	-13.134
280.0	1232.8	10.7304	12.0382	8.7817	6.8705		20.57	55.38	0.6005E-13	-13.221
290.0	1236.5	10.6075	11.9760	8.6739	6.8544		20.25	56.60	0.4929E-13	-13.307
300.0	1239.5	10.4855	11.9145	8.5670	6.8387		19.94	57.79	0.4066E-13	-13.391
320.0	1243.6	10.2441	11.7931	8.3554	6.8077		19.36	60.09	0.2802E-13	-13.553
340.0	1246.1	10.0052	11.6732	8.1462	6.7776		18.83	62.28	0.1961E-13	-13.708
360.0	1247.6	9.7685	11.5546	7.9389	6.7485		18.34	64.38	0.1392E-13	-13.856
380.0	1248.5	9.5336	11.4370	7.7332	6.7202		17.91	66.39	0.9999E-14	-14.000
400.0	1249.1	9.3004	11.3203	7.5290	6.6927		17.52	68.33	0.7265E-14	-14.139
420.0	1249.5	9.0687	11.2044	7.3261	6.6656		17.17	70.13	0.5331E-14	-14.273
440.0	1249.7	8.8384	11.0892	7.1246	6.6388		16.85	71.89	0.3947E-14	-14.404
460.0	1249.9	8.6096	10.9748	6.9242	6.6121		16.55	73.61	0.2946E-14	-14.531
480.0	1249.9	8.3821	10.8610	6.7251	6.5737		16.28	75.31	0.2214E-14	-14.655
500.0	1249.9	8.1560	10.7480	6.5271	6.5454	3.8616	16.01	77.02	0.1674E-14	-14.776
520.0	1250.0	7.9312	10.6356	6.3303	6.5172	3.8545	15.74	78.79	0.1274E-14	-14.895
540.0	1250.0	7.7078	10.5238	6.1347	6.4893	3.8474	15.47	80.61	0.9741E-15	-15.011
560.0	1250.0	7.4856	10.4127	5.9402	6.4615	3.8404	15.20	82.57	0.7486E-15	-15.126
580.0	1250.0	7.2647	10.3023	5.7468	6.4338	3.8335	14.90	84.69	0.5779E-15	-15.238
600.0	1250.0	7.0451	10.1925	5.5546	6.4064	3.8265	14.58	87.03	0.4489E-15	-15.349
620.0	1250.0	6.8268	10.0833	5.3634	6.3790	3.8197	14.24	89.63	0.3489E-15	-15.457
640.0	1250.0	6.6096	9.9748	5.1733	6.3519	3.8128	13.87	92.56	0.2728E-15	-15.564
660.0	1250.0	6.3938	9.8668	4.9843	6.3249	3.8060	13.47	95.87	0.2142E-15	-15.669
680.0	1250.0	6.1791	9.7595	4.7964	6.2980	3.7993	13.03	99.63	0.1689E-15	-15.772
700.0	1250.0	5.9657	9.6528	4.6096	6.2713	3.7925	12.57	103.91	0.1338E-15	-15.874
750.0	1250.0	5.4374	9.3887	4.1471	6.2052	3.7759	11.29	117.28	0.7635E-16	-16.117
800.0	1250.0	4.9165	9.1282	3.6910	6.1400	3.7595	9.93	135.22	0.4511E-16	-16.346
850.0	1250.0	4.4028	8.8713	3.2413	6.0758	3.7433	8.61	158.17	0.2776E-16	-16.557
900.0	1250.0	3.8962	8.6180	2.7978	6.0124	3.7273	7.44	185.71	0.1790F-16	-16.747
950.0	1250.0	3.3965	8.3682	2.3603	5.9498	3.7116	6.47	216.28	0.1214E-16	-16.916
1000.0	1250.0	-3.0964	8.1218	1.9288	5.8882	3.6961	5.73	247.55	0.8667E-17	-17.062

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1200 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG OEN GM/CM3
120.0	355.0	10.9751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	565.2	10.3363	10.5183	11.1072	7.3719		26.32	18.29	0.7982E-11	-11.098
140.0	692.5	9.9785	10.2874	10.7810	7.2757		25.83	23.75	0.3830E-11	-11.417
150.0	806.7	9.7034	10.1167	10.5319	7.2085		25.38	28.23	0.2199E-11	-11.658
160.0	895.2	9.4749	9.9799	10.3262	7.1575		24.96	31.96	0.1398E-11	-11.854
170.0	963.8	9.2755	9.8641	10.1476	7.1167		24.55	35.09	0.9489E-12	-12.023
180.0	1017.0	9.0955	9.7625	9.9872	7.0826		24.14	37.76	0.6717E-12	-12.173
190.0	1058.1	8.9292	9.6707	9.8394	7.0533		23.75	40.07	0.4911E-12	-12.309
200.0	1090.1	8.7727	9.5860	9.7008	7.0273		23.35	42.11	0.3675E-12	-12.435
210.0	1114.8	8.6235	9.5065	9.5690	7.0038		22.96	43.93	0.2801E-12	-12.553
220.0	1134.0	8.4797	9.4310	9.4422	6.9822		22.57	45.59	0.2165E-12	-12.664
230.0	1148.8	8.3401	9.3583	9.3193	6.9619		22.19	47.13	0.1693E-12	-12.771
240.0	1160.3	8.2038	9.2880	9.1994	6.9427		21.81	48.57	0.1337E-12	-12.874
250.0	1169.3	8.0700	9.2195	9.0819	6.9243		21.45	49.93	0.1065E-12	-12.973
260.0	1176.2	7.9383	9.1523	8.9662	6.9066		21.08	51.24	0.8542E-13	-13.068
270.0	1181.5	7.8082	9.0863	8.8521	6.8893		20.73	52.51	0.6896E-13	-13.161
280.0	1185.7	7.6794	9.0211	8.7392	6.8724		20.39	53.73	0.5599E-13	-13.252
290.0	1188.9	7.5518	8.9567	8.6273	6.8559		20.07	54.92	0.4570E-13	-13.340
300.0	1191.4	7.4251	8.8929	8.5162	6.8396		19.75	56.09	0.3749E-13	-13.426
320.0	1194.8	7.1741	8.7668	8.2963	6.8076		19.16	58.33	0.2557E-13	-13.592
340.0	1196.9	6.9256	8.6422	8.0787	6.7761		18.62	60.47	0.1772E-13	-13.752
360.0	1198.1	6.6792	8.5188	7.8629	6.7451		18.14	62.51	0.1245E-13	-13.905
380.0	1198.9	6.4347	8.3963	7.6488	6.7143		17.71	64.45	0.8868E-14	-14.052
400.0	1199.3	6.1918	8.2748	7.4362	6.6839		17.33	66.30	0.6387E-14	-14.195
420.0	1199.6	5.9505	8.1541	7.2249	6.6536		16.98	68.07	0.4647E-14	-14.333
440.0	1199.8	5.7107	8.0342	7.0150	6.6236		16.67	69.78	0.3411E-14	-14.467
460.0	1199.9	5.4724	7.9150	6.8063	6.5937		16.37	71.46	0.2524E-14	-14.598
480.0	1199.9	5.2355	7.7966	6.5989	6.5641		16.09	73.13	0.1881E-14	-14.726
500.0	1199.9	4.9999	7.6788	6.3927	6.5346	3.9578	15.81	74.85	0.1411E-14	-14.850
520.0	1200.0	4.7658	7.5617	6.1877	6.5053	3.9504	15.54	76.63	0.1064E-14	-14.973
540.0	1200.0	4.5330	7.4453	5.9839	6.4762	3.9431	15.25	78.53	0.8073E-15	-15.093
560.0	1200.0	4.3016	7.3296	5.7813	6.4472	3.9358	14.95	80.59	0.6153E-15	-15.211
580.0	1200.0	4.0715	7.2146	5.5799	6.4184	3.9286	14.62	82.87	0.4711E-15	-15.327
600.0	1200.0	3.8428	7.1002	5.3796	6.3898	3.9214	14.26	85.43	0.3624E-15	-15.441
620.0	1200.0	3.6153	6.9865	5.1805	6.3614	3.9142	13.88	88.31	0.2801E-15	-15.553
640.0	1200.0	3.3892	6.8734	4.9825	6.3331	3.9071	13.46	91.60	0.2174E-15	-15.663
660.0	1200.0	3.1643	6.7610	4.7856	6.3049	3.9000	13.00	95.36	0.1696E-15	-15.771
680.0	1200.0	2.9407	6.6492	4.5899	6.2770	3.8929	12.51	99.66	0.1329E-15	-15.877
700.0	1200.0	2.7184	6.5380	4.3953	6.2491	3.8859	11.99	104.58	0.1047E-15	-15.980
750.0	1200.0	2.1681	6.2628	3.9135	6.1803	3.8686	10.59	120.05	0.5913E-16	-16.228
800.0	1200.0	1.6255	5.9915	3.4384	6.1124	3.8515	9.17	140.62	0.3481E-16	-16.458
850.0	1200.0	1.0904	5.7240	2.9703	6.0454	3.8346	7.86	166.34	0.2151E-16	-16.667
900.0	1200.0	0.5626	5.4601	2.5080	5.9794	3.8180	6.77	195.99	0.1403E-16	-16.853
950.0	1200.0	0.0421	5.1999	2.0523	5.9143	3.8016	5.92	227.23	0.9682E-17	-17.014
1000.0	1200.0	-0.4713	4.9432	1.6028	5.8500	3.7854	5.29	257.36	0.7050E-17	-17.152

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1150 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	359.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	538.6	10.3393	10.5224	11.1105	7.3745		26.31	18.07	0.8044E-11	-11.095
140.0	679.7	9.9803	10.2924	10.7836	7.2769		25.81	23.32	0.3855E-11	-11.414
150.0	788.3	9.7027	10.1214	10.5326	7.2133		25.36	27.62	0.2205E-11	-11.657
160.0	871.8	9.4711	9.9837	10.3243	7.1627		24.92	31.17	0.1395E-11	-11.856
170.0	936.0	9.2681	9.8668	10.1428	7.1220		24.50	34.15	0.9403E-12	-12.027
180.0	985.4	9.0843	9.7637	9.9791	7.0880		24.08	36.69	0.6621E-12	-12.179
190.0	1023.4	8.9139	9.6703	9.8279	7.0585		23.66	38.89	0.4809E-12	-12.318
200.0	1052.7	8.7531	9.5838	9.6856	7.0324		23.25	40.83	0.3576E-12	-12.447
210.0	1075.1	8.5994	9.5024	9.5499	7.0086		22.85	42.57	0.2706E-12	-12.568
220.0	1092.4	8.4510	9.4247	9.4191	6.9866		22.45	44.17	0.2078E-12	-12.682
230.0	1105.7	8.3067	9.3499	9.2921	6.9659		22.05	45.65	0.1614E-12	-12.792
240.0	1115.9	8.1655	9.2773	9.1680	6.9463		21.66	47.04	0.1266E-12	-12.897
250.0	1123.8	8.0267	9.2064	9.0461	6.9274		21.28	48.37	0.1002E-12	-12.999
260.0	1129.9	7.8900	9.1369	8.9261	6.9092		20.90	49.65	0.7982E-13	-13.098
270.0	1134.5	7.7548	9.0684	8.8075	6.8914		20.54	50.88	0.6403E-13	-13.194
280.0	1138.1	7.6209	9.0007	8.6901	6.8739		20.20	52.08	0.5167E-13	-13.287
290.0	1140.8	7.4880	8.9338	8.5737	6.8568		19.86	53.25	0.4192E-13	-13.378
300.0	1142.9	7.3561	8.8675	8.4581	6.8399		19.54	54.38	0.3419E-13	-13.466
320.0	1145.8	7.3946	8.7361	8.2290	6.8066		18.94	56.57	0.2355E-13	-13.637
340.0	1147.5	6.8356	8.6063	8.0022	6.7739		18.41	58.66	0.1581E-13	-13.801
360.0	1148.5	6.5787	8.4777	7.7772	6.7416		17.93	60.63	0.1100E-13	-13.958
380.0	1149.1	6.3237	8.3500	7.5539	6.7095		17.51	62.50	0.7759E-14	-14.110
400.0	1149.5	6.0703	8.2233	7.3321	6.6778		17.13	64.28	0.5536E-14	-14.257
420.0	1149.7	5.8186	8.0974	7.1117	6.6462		16.79	65.99	0.3990E-14	-14.399
440.0	1149.8	5.5684	7.9723	6.8926	6.6149		16.47	67.66	0.2903E-14	-14.537
460.0	1149.9	5.3197	7.8479	6.6749	6.5838		16.18	69.30	0.2128E-14	-14.672
480.0	1149.9	5.0725	7.7243	6.4585	6.5528		15.89	70.98	0.1572E-14	-14.804
500.0	1150.0	4.8267	7.6014	6.2434	6.5221	4.0619	15.60	72.71	0.1168E-14	-14.932
520.0	1150.0	4.5824	7.4793	6.0295	6.4915	4.0542	15.30	74.55	0.8733E-15	-15.059
540.0	1150.0	4.3395	7.3578	5.8168	6.4611	4.0465	14.99	76.56	0.6564E-15	-15.183
560.0	1150.0	4.0980	7.2371	5.6054	6.4309	4.0389	14.65	78.78	0.4959E-15	-15.305
580.0	1150.0	3.8579	7.1170	5.3952	6.4009	4.0313	14.28	81.29	0.3765E-15	-15.424
600.0	1150.0	3.6192	6.9977	5.1862	6.3710	4.0238	13.88	84.14	0.2872E-15	-15.542
620.0	1150.0	3.3819	6.8790	4.9784	6.3413	4.0163	13.44	87.40	0.2202E-15	-15.657
640.0	1150.0	3.1459	6.7610	4.7718	6.3118	4.0089	12.96	91.17	0.1697E-15	-15.770
660.0	1150.0	2.9113	6.6437	4.5664	6.2824	4.0015	12.44	95.52	0.1315E-15	-15.881
680.0	1150.0	2.6780	6.5270	4.3622	6.2532	3.9942	11.89	100.52	0.1024E-15	-15.990
700.0	1150.0	2.4460	6.4110	4.1591	6.2242	3.9869	11.31	106.26	0.8029E-16	-16.095
750.0	1150.0	1.8717	6.1239	3.6564	6.1523	3.9688	9.81	124.27	0.4501E-16	-16.347
800.0	1150.0	1.3055	5.8408	3.1607	6.0815	3.9509	8.36	147.80	0.2652E-16	-16.576
850.0	1150.0	0.7472	5.5616	2.6718	6.0116	3.9333	7.12	176.13	0.1655E-16	-16.781
900.0	1150.0	0.1965	5.2863	2.1897	5.9427	3.9160	6.14	207.09	0.1098E-16	-16.959
950.0	1150.0	-0.3466	5.0147	1.7142	5.8748	3.8989	5.42	237.71	0.7747E-17	-17.111
1000.0	1150.0	-0.8824	4.7469	1.2452	5.8078	3.8820	4.92	265.37	0.5767E-17	-17.239

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1100 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.3	10.3751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	531.0	10.1427	10.5272	11.1142	7.3793		26.31	17.92	5.8116E-11	-11.091
140.0	665.4	9.8932	10.2979	10.7866	7.2847		25.80	22.84	3.3882E-11	-11.411
150.0	768.1	9.7016	10.1265	10.5332	7.2188		25.33	26.94	2.2210E-11	-11.656
160.0	846.5	9.4661	9.9876	10.3216	7.1684		24.88	30.32	1.4389E-11	-11.857
170.0	906.4	9.2580	9.8692	10.1365	7.1278		24.46	33.15	9.3930E-12	-12.032
180.0	952.1	9.0736	9.7644	9.9692	7.0937		24.09	35.56	6.1531E-12	-12.187
190.0	987.0	8.9954	9.6690	9.8137	7.0640		23.57	47.66	4.0687E-12	-12.329
200.0	1013.7	8.7237	9.5803	9.6671	7.0375		23.14	39.51	2.6458E-12	-12.461
210.0	1034.1	8.5709	9.4966	9.5273	7.0134		22.72	41.18	1.7597E-12	-12.586
220.0	1049.7	8.4172	9.4165	9.3917	6.9909		22.32	42.72	1.1979E-12	-12.704
230.0	1061.6	8.2675	9.3392	9.2600	6.9698		21.89	44.15	8.1526E-13	-12.817
240.0	1070.6	8.1209	9.2640	9.1311	6.9496		21.48	45.50	5.5188E-13	-12.925
250.0	1077.6	7.9766	9.1905	9.0045	6.9302		21.09	46.80	3.7328E-13	-13.030
260.0	1082.9	7.8342	9.1182	8.8796	6.9113		20.70	48.05	2.5381E-13	-13.132
270.0	1086.9	7.6934	9.0470	8.7561	6.8929		20.33	49.25	1.7880E-13	-13.231
280.0	1090.0	7.5538	8.9766	8.6337	6.8748		19.98	50.42	1.2713E-13	-13.327
290.0	1092.4	7.4152	8.9068	8.5123	6.8570		19.64	51.57	9.1830E-14	-13.420
300.0	1094.2	7.2776	8.8377	8.3917	6.8394		19.31	52.68	6.6080E-14	-13.512
320.0	1096.6	7.0046	8.7007	8.1526	6.8048		18.71	54.81	3.5952E-14	-13.688
340.0	1098.0	6.7340	8.5651	7.9156	6.7707		18.18	56.83	2.1392E-14	-13.856
360.0	1098.8	6.4656	8.4307	7.6806	6.7369		17.71	58.74	1.3583E-14	-14.019
380.0	1099.3	6.1990	8.2973	7.4472	6.7035		17.29	60.54	8.6688E-15	-14.175
400.0	1099.6	5.9342	8.1649	7.2153	6.6703		16.92	62.25	5.4724E-15	-14.326
420.0	1099.8	5.6711	8.0333	6.9850	6.6373		16.58	63.91	3.3371E-15	-14.472
440.0	1099.9	5.4095	7.9025	6.7560	6.6046		16.27	65.53	2.0428E-15	-14.615
460.0	1099.9	5.1495	7.7725	6.5284	6.5720		15.97	67.16	1.1763E-15	-14.754
480.0	1100.0	4.8911	7.6433	6.3021	6.5397		15.67	68.85	6.7289E-16	-14.890
500.0	1100.0	4.6342	7.5148	6.0772	6.5075	4.1746	15.36	72.64	3.9485E-16	-15.023
520.0	1100.0	4.3788	7.3871	5.8536	6.4756	4.1665	15.04	72.59	0.7021E-15	-15.154
540.0	1100.0	4.1248	7.2601	5.6313	6.4438	4.1585	14.68	74.76	0.5227E-15	-15.282
560.0	1100.0	3.8724	7.1339	5.4103	6.4122	4.1506	14.30	77.21	0.3911E-15	-15.408
580.0	1100.0	3.6214	7.0084	5.1905	6.3808	4.1427	13.88	80.03	0.2943E-15	-15.531
600.0	1100.0	3.3718	6.8836	4.9720	6.3496	4.1348	13.41	83.28	0.2226E-15	-15.653
620.0	1100.0	3.1237	6.7595	4.7548	6.3185	4.1270	12.90	87.07	0.1693E-15	-15.771
640.0	1100.0	2.8770	6.6362	4.5388	6.2877	4.1192	12.35	91.47	0.1295E-15	-15.888
660.0	1100.0	2.6317	6.5135	4.3241	6.2570	4.1115	11.77	96.58	0.9971E-16	-16.001
680.0	1100.0	2.3878	6.3916	4.1105	6.2265	4.1038	11.15	102.48	0.7728E-16	-16.112
700.0	1100.0	2.1452	6.2703	3.8982	6.1961	4.0962	10.52	109.25	0.6034E-16	-16.219
750.0	1100.0	1.5449	5.9702	3.3726	6.1210	4.0772	8.95	130.26	0.3372E-16	-16.472
800.0	1100.0	0.9530	5.6742	2.8544	6.0469	4.0586	7.54	156.84	0.2001E-16	-16.699
850.0	1100.0	0.3692	5.3823	2.3433	5.9739	4.0402	6.40	187.19	0.1270E-16	-16.896
900.0	1100.0	-0.2065	5.0945	1.8393	5.9015	4.0221	5.57	218.14	0.8626E-17	-17.064
950.0	1100.0	-0.7743	4.8106	1.3422	5.8308	4.0042	5.00	246.66	0.6238E-17	-17.205
1000.0	1100.0	-1.3344	4.5305	0.8519	5.7607	3.9865	4.61	270.74	0.4753E-17	-17.323

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1050 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.9751	10.4808	11.6021	7.5315		26.90	11.67	0.2461E-10	-10.609
130.0	522.5	10.3466	10.5327	11.1185	7.3823		26.30	17.54	0.8197E-11	-11.086
140.0	649.6	9.9841	10.3341	10.7893	7.2501		25.78	22.31	0.3911E-11	-11.408
150.0	746.1	9.6997	10.1319	10.5329	7.2248		25.30	26.20	0.2213E-11	-11.655
160.0	819.3	9.4598	9.9916	10.3178	7.1746		24.83	29.40	0.1381E-11	-11.860
170.0	874.9	9.2476	9.8712	10.1285	7.1340		24.37	32.09	0.9169E-12	-12.038
180.0	917.1	9.0541	9.7642	9.9565	7.0997		23.92	34.38	0.6354E-12	-12.197
190.0	949.1	8.8734	9.6664	9.7965	7.0697		23.46	36.37	0.4561E-12	-12.343
200.0	973.4	8.7020	9.5752	9.6450	7.0428		23.02	38.15	0.3321E-12	-12.479
210.0	991.9	8.5373	9.4888	9.4999	7.0181		22.57	39.76	0.2473E-12	-12.607
220.0	1005.9	8.3777	9.4060	9.3594	6.9952		22.14	41.24	0.1868E-12	-12.729
230.0	1016.5	8.2220	9.3258	9.2225	6.9734		21.71	42.63	0.1428E-12	-12.845
240.0	1024.6	8.0692	9.2477	9.0883	6.9526		21.28	43.95	0.1103E-12	-12.957
250.0	1030.7	7.9188	9.1712	8.9563	6.9325		20.88	45.22	0.8592E-13	-13.066
260.0	1035.4	7.7701	9.0959	8.8259	6.9129		20.48	46.44	0.6747E-13	-13.171
270.0	1038.9	7.6230	9.0216	8.6969	6.8938		20.10	47.62	0.5335E-13	-13.273
280.0	1041.6	7.4771	8.9481	8.5691	6.8750		19.74	48.77	0.4246E-13	-13.372
290.0	1043.6	7.3323	8.8753	8.4421	6.8564		19.39	49.88	0.3400E-13	-13.469
300.0	1045.1	7.1883	8.8030	8.3160	6.8381		19.07	50.96	0.2737E-13	-13.563
320.0	1047.2	6.9026	8.6597	8.0657	6.8019		18.47	53.04	0.1801E-13	-13.744
340.0	1048.4	6.6193	8.5178	7.8177	6.7663		17.94	54.99	0.1227E-13	-13.911
360.0	1049.1	6.3382	8.3771	7.5716	6.7309		17.48	56.82	0.8216E-14	-14.085
380.0	1049.5	6.0590	8.2374	7.3271	6.6959		17.07	58.55	0.5671E-14	-14.246
400.0	1049.7	5.7817	8.0987	7.0843	6.6612		16.70	60.20	0.3962E-14	-14.402
420.0	1049.8	5.5060	7.9608	6.8430	6.6267		16.37	61.81	0.2797E-14	-14.553
440.0	1049.9	5.2320	7.8238	6.6031	6.5924		16.05	63.41	0.1992E-14	-14.701
460.0	1049.9	4.9597	7.6877	6.3647	6.5583		15.74	65.05	0.1431E-14	-14.844
480.0	1050.0	4.6889	7.5523	6.1276	6.5244		15.42	66.79	0.1035E-14	-14.985
500.0	1050.0	4.4198	7.4177	5.8920	6.4907	4.2969	15.08	68.68	0.7533E-15	-15.123
520.0	1050.0	4.1522	7.2839	5.6578	6.4572	4.2885	14.72	70.79	0.5518E-15	-15.258
540.0	1050.0	3.8862	7.1509	5.4249	6.4240	4.2801	14.32	73.20	0.4065E-15	-15.391
560.0	1050.0	3.6217	7.0187	5.1933	6.3909	4.2718	13.87	75.98	0.3012E-15	-15.521
580.0	1050.0	3.3588	6.8872	4.9631	6.3580	4.2635	13.38	79.24	0.2245E-15	-15.649
600.0	1050.0	3.0973	6.7565	4.7342	6.3252	4.2552	12.84	83.05	0.1683E-15	-15.774
620.0	1050.0	2.8374	6.6265	4.5067	6.2927	4.2470	12.25	87.53	0.1270E-15	-15.896
640.0	1050.0	2.5789	6.4973	4.2804	6.2604	4.2389	11.63	92.77	0.9652E-16	-16.015
660.0	1050.0	2.3219	6.3688	4.0554	6.2282	4.2308	10.97	98.87	0.7391E-16	-16.131
680.0	1050.0	2.0664	6.2410	3.8317	6.1963	4.2228	10.30	105.90	0.5707E-16	-16.244
700.0	1050.0	1.8123	6.1140	3.6093	6.1645	4.2148	9.63	113.92	0.4447E-16	-16.352
750.0	1050.0	1.1834	5.7995	3.0587	6.0858	4.1949	8.05	138.28	0.2492E-16	-16.603
800.0	1050.0	0.5633	5.4894	2.5157	6.0082	4.1754	6.73	167.58	0.1501E-16	-16.824
850.0	1050.0	-0.0483	5.1837	1.9804	5.9317	4.1561	5.76	198.76	0.9763E-17	-17.010
900.0	1050.0	-0.6514	4.8821	1.4524	5.8562	4.1371	5.09	228.13	0.6823E-17	-17.166
950.0	1050.0	-1.2462	4.5847	0.9316	5.7818	4.1184	4.65	253.14	0.5065E-17	-17.295
1000.0	1050.0	-1.8330	4.2913	0.4179	5.7084	4.0999	4.37	273.06	0.3937E-17	-17.405

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 1000 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	513.0	10.3509	10.5388	11.1233	7.3868		26.29	17.22	0.8289E-11	-11.082
140.0	632.3	9.9863	10.3109	10.7925	7.2962		25.76	21.76	0.3963E-11	-11.494
150.0	722.4	9.6972	10.1376	10.5324	7.2314		25.26	25.41	0.2214E-11	-11.655
160.0	790.4	9.4519	9.9954	10.3128	7.1814		24.77	28.43	0.1369E-11	-11.864
170.0	841.8	9.2339	9.8728	10.1186	7.1406		24.29	30.97	0.9006E-12	-12.045
180.0	880.5	9.0342	9.7631	9.9414	7.1059		23.81	33.15	0.6179E-12	-12.209
190.0	909.8	8.8473	9.6626	9.7759	7.0755		23.34	35.05	0.4372E-12	-12.359
200.0	931.9	8.6693	9.5684	9.6188	7.0481		22.87	36.75	0.3166E-12	-12.499
210.0	948.6	8.4981	9.4789	9.4679	7.0228		22.41	38.30	0.2334E-12	-12.632
220.0	961.2	8.3318	9.3929	9.3216	6.9992		21.95	39.74	0.1747E-12	-12.758
230.0	970.7	8.1692	9.3095	9.1798	6.9767		21.50	41.10	0.1323E-12	-12.878
240.0	977.9	8.0096	9.2281	9.0386	6.9552		21.06	42.39	0.1012E-12	-12.995
250.0	983.3	7.8522	9.1482	8.9006	6.9343		20.64	43.63	0.7820E-13	-13.107
260.0	987.4	7.6967	9.0695	8.7642	6.9139		20.24	44.82	0.6090E-13	-13.215
270.0	990.5	7.5426	8.9918	8.6291	6.8940		19.85	45.98	0.4777E-13	-13.321
280.0	992.8	7.3897	8.9148	8.4951	6.8744		19.48	47.10	0.3773E-13	-13.423
290.0	994.6	7.2378	8.8385	8.3620	6.8550		19.13	48.19	0.2999E-13	-13.523
300.0	995.9	7.0868	8.7627	8.2298	6.8358		18.80	49.24	0.2397E-13	-13.620
320.0	997.7	6.7871	8.6124	7.9672	6.7979		18.21	51.25	0.1556E-13	-13.808
340.0	998.7	6.4898	8.4636	7.7070	6.7605		17.69	53.13	0.1030E-13	-13.987
360.0	999.2	6.1947	8.3159	7.4486	6.7235		17.23	54.88	0.6924E-14	-14.160
380.0	999.6	5.9017	8.1693	7.1920	6.6867		16.83	56.54	0.4722E-14	-14.326
400.0	999.8	5.6105	8.0237	6.9371	6.6502		16.47	58.13	0.3259E-14	-14.487
420.0	999.9	5.3211	7.8790	6.6837	6.6140		16.14	59.70	0.2273E-14	-14.643
440.0	999.9	5.0334	7.7351	6.4318	6.5780		15.81	61.30	0.1600E-14	-14.796
460.0	1000.0	4.7474	7.5921	6.1815	6.5422		15.48	62.99	0.1135E-14	-14.945
480.0	1000.0	4.4632	7.4500	5.9326	6.5066		15.13	64.83	0.8115E-15	-15.091
500.0	1000.0	4.1806	7.3087	5.6852	6.4713	4.4300	14.75	66.89	0.5838E-15	-15.234
520.0	1000.0	3.8996	7.1682	5.4392	6.4361	4.4212	14.33	69.25	0.4227E-15	-15.374
540.0	1000.0	3.6203	7.0285	5.1947	6.4012	4.4124	13.86	72.01	0.3080E-15	-15.511
560.0	1000.0	3.3426	6.8897	4.9516	6.3664	4.4036	13.34	75.26	0.2258E-15	-15.646
580.0	1000.0	3.0665	6.7516	4.7099	6.3319	4.3949	12.76	79.12	0.1667E-15	-15.778
600.0	1000.0	2.7920	6.6144	4.4695	6.2975	4.3863	12.13	83.70	0.1240E-15	-15.907
620.0	1000.0	2.5190	6.4779	4.2306	6.2634	4.3777	11.46	89.10	0.9288E-16	-16.032
640.0	1000.0	2.2476	6.3422	3.9930	6.2294	4.3691	10.76	95.44	0.7020E-16	-16.154
660.0	1000.0	1.9778	6.2073	3.7568	6.1957	4.3606	10.05	102.79	0.5356E-16	-16.271
680.0	1000.0	1.7095	6.0732	3.5219	6.1621	4.3522	9.34	111.20	0.4129E-16	-16.384
700.0	1000.0	1.4427	5.9398	3.2883	6.1287	4.3438	8.66	120.67	0.3219E-16	-16.492
750.0	1000.0	0.7824	5.6096	2.7102	6.0461	4.3230	7.14	148.41	0.1826E-16	-16.738
800.0	1000.0	0.1312	5.2840	2.1401	5.9646	4.3025	5.99	179.47	0.1128E-16	-16.948
850.0	1000.0	-0.5109	4.9629	1.5780	5.8843	4.2822	5.20	209.75	0.7566E-17	-17.121
900.0	1000.0	-1.1442	4.6463	1.0236	5.8050	4.2623	4.68	235.88	0.5451E-17	-17.264
950.0	1000.0	-1.7688	4.3340	0.4768	5.7265	4.2426	4.36	256.64	0.4147E-17	-17.382
1000.0	1000.0	-2.3849	4.0260	-0.0626	5.6498	4.2232	4.17	272.51	0.3278E-17	-17.484

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 950 DEGREES

HEIGHT KM	TEMP. DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	13.4751	13.4838	11.6221	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	502.7	13.3557	13.5456	11.1285	7.3917		26.29	16.88	0.8392E-11	-11.076
140.0	613.7	13.2478	13.5189	10.7957	7.3028		25.74	21.12	0.3976E-11	-11.401
150.0	697.2	13.1698	13.5436	10.5514	7.2366		25.22	24.56	0.2213E-11	-11.655
160.0	759.9	13.4422	13.5991	10.3265	7.1886		24.71	27.41	0.1356E-11	-11.868
170.0	807.1	13.2175	13.6737	10.1265	7.1476		24.20	29.81	0.8808E-12	-12.055
180.0	842.6	13.0108	13.7613	9.9232	7.1125		23.70	31.87	0.5975E-12	-12.224
190.0	869.2	12.8166	13.8571	9.7515	7.0815		23.20	33.69	0.4180E-12	-12.379
200.0	889.1	12.6312	13.9595	9.5880	7.0534		22.71	35.33	0.2993E-12	-12.524
210.0	904.4	12.4525	14.0665	9.4326	7.0274		22.22	36.83	0.2181E-12	-12.661
220.0	915.7	12.2786	14.1768	9.2777	7.0035		21.74	38.23	0.1616E-12	-12.792
230.0	924.2	12.1084	14.2897	9.1282	6.9797		21.27	39.55	0.1211E-12	-12.917
240.0	930.6	11.9413	14.4045	8.9813	6.9572		20.82	40.82	0.9180E-13	-13.037
250.0	935.4	11.7759	14.5209	8.8365	6.9355		20.38	42.03	0.7024E-13	-13.153
260.0	939.1	11.6126	14.6384	8.6933	6.9142		19.97	43.20	0.5420E-13	-13.266
270.0	941.8	11.4537	14.7568	8.5514	6.8933		19.57	44.34	0.4216E-13	-13.375
280.0	943.9	11.2990	14.8760	8.4106	6.8728		19.20	45.43	0.3302E-13	-13.481
290.0	945.3	11.1504	14.9959	8.2707	6.8524		18.85	46.49	0.2604E-13	-13.584
300.0	946.5	11.0116	15.1161	8.1316	6.8323		18.52	47.51	0.2066E-13	-13.685
320.0	948.0	10.7443	15.3581	7.8555	6.7925		17.93	49.44	0.1322E-13	-13.879
340.0	948.8	10.4935	15.6015	7.5816	6.7532		17.43	51.24	0.8627E-14	-14.064
360.0	949.4	10.2580	15.8462	7.3098	6.7142		16.98	52.91	0.5724E-14	-14.242
380.0	949.6	10.0365	16.0919	7.0397	6.6756		16.59	54.50	0.3852E-14	-14.414
400.0	949.8	9.8280	16.3386	6.7714	6.6372		16.23	56.05	0.2624E-14	-14.581
420.0	949.9	9.6314	16.5863	6.5047	6.5990		15.89	57.61	0.1806E-14	-14.743
440.0	949.9	9.4456	16.8348	6.2396	6.5611		15.54	59.25	0.1254E-14	-14.902
460.0	950.0	9.2696	17.0843	5.9761	6.5235		15.18	61.03	0.8783E-15	-15.056
480.0	950.0	9.1034	17.3347	5.7141	6.4860		14.78	63.04	0.6195E-15	-15.208
500.0	950.0	8.9429	17.5860	5.4537	6.4488	4.5753	14.34	65.36	0.4401E-15	-15.356
520.0	950.0	8.6172	17.8381	5.1947	6.4118	4.5660	13.84	68.10	0.3147E-15	-15.502
540.0	950.0	8.3231	18.0911	4.9373	6.3750	4.5568	13.28	71.37	0.2267E-15	-15.645
560.0	950.0	8.0308	18.7449	4.6814	6.3384	4.5475	12.67	75.23	0.1645E-15	-15.784
580.0	950.0	7.7402	18.5996	4.4270	6.3021	4.5384	11.99	79.99	0.1203E-15	-15.920
600.0	950.0	7.4512	18.4551	4.1740	6.2659	4.5293	11.27	85.60	0.8879E-16	-16.052
620.0	950.0	7.1639	18.3115	3.9225	6.2300	4.5202	10.52	92.23	0.6617E-16	-16.179
640.0	950.0	6.8783	18.1687	3.6724	6.1942	4.5112	9.76	99.97	0.4985E-16	-16.302
660.0	950.0	6.5942	18.0266	3.4237	6.1587	4.5023	9.02	108.85	0.3801E-16	-16.420
680.0	950.0	6.3118	17.8854	3.1765	6.1234	4.4934	8.30	118.84	0.2936E-16	-16.532
700.0	950.0	6.0313	17.7450	2.9306	6.0882	4.4845	7.64	129.85	0.2301E-16	-16.638
750.0	950.0	5.3358	17.3975	2.3221	6.0012	4.4626	6.28	160.38	0.1336E-16	-16.874
800.0	950.0	-0.3496	5.0548	1.7220	5.9155	4.4410	5.33	191.52	0.8534E-17	-17.069
850.0	950.0	-1.0255	4.7168	1.1303	5.8309	4.4198	4.73	219.01	0.5932E-17	-17.227
900.0	950.0	-1.6921	4.3835	0.5467	5.7475	4.3988	4.36	240.88	0.4401E-17	-17.356
950.0	950.0	-2.3495	4.0548	-0.0289	5.6652	4.3780	4.13	257.44	0.3417E-17	-17.466
1000.0	950.0	-2.9981	3.7305	-0.5967	5.5841	4.3576	3.99	270.05	0.2732E-17	-17.563

TABLE 1.--Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 900 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	491.6	10.3608	10.5530	11.1343	7.3972		26.28	16.51	0.8506E-11	-11.070
140.0	593.9	9.9895	10.3263	10.7990	7.3101		25.71	20.46	0.4010E-11	-11.397
150.0	673.6	9.6894	10.1499	10.5296	7.2464		25.17	23.67	0.2210E-11	-11.656
160.0	728.1	9.4306	10.0026	10.2986	7.1964		24.63	26.34	0.1336E-11	-11.874
170.0	771.2	9.1981	9.8739	10.0920	7.1549		24.10	28.60	0.8575E-12	-12.067
180.0	803.4	8.9833	9.7576	9.9017	7.1192		23.57	30.56	0.5741E-12	-12.241
190.0	827.6	8.7807	9.6498	9.7228	7.0875		23.06	32.30	0.3964E-12	-12.402
200.0	845.8	8.5870	9.5483	9.5520	7.0586		22.52	33.88	0.2803E-12	-12.552
210.0	859.4	8.3997	9.4512	9.3871	7.0317		22.00	35.33	0.2019E-12	-12.695
220.0	869.5	8.2172	9.3574	9.2267	7.0064		21.50	36.70	0.1477E-12	-12.831
230.0	877.2	8.0384	9.2660	9.0697	6.9821		21.02	38.00	0.1095E-12	-12.961
240.0	882.9	7.8623	9.1766	8.9152	6.9587		20.55	39.24	0.8210E-13	-13.086
250.0	887.2	7.6885	9.0887	8.7628	6.9359		20.10	40.43	0.6217E-13	-13.206
260.0	890.4	7.5165	9.0019	8.6120	6.9136		19.67	41.57	0.4752E-13	-13.323
270.0	892.8	7.3459	8.9160	8.4625	6.8917		19.27	42.68	0.3662E-13	-13.436
280.0	894.6	7.1765	8.8308	8.3141	6.8701		18.90	43.75	0.2843E-13	-13.546
290.0	896.0	7.0082	8.7463	8.1666	6.8487		18.55	44.77	0.2223E-13	-13.653
300.0	897.0	6.8407	8.6624	8.0200	6.8275		18.23	45.75	0.1749E-13	-13.757
320.0	898.3	6.5080	8.4957	7.7286	6.7855		17.65	47.60	0.1102E-13	-13.958
340.0	899.0	6.1780	8.3305	7.4397	6.7441		17.16	49.31	0.7083E-14	-14.150
360.0	899.5	5.8503	8.1665	7.1527	6.7030		16.72	50.91	0.4631E-14	-14.334
380.0	899.7	5.5247	8.0037	6.8677	6.6622		16.33	52.45	0.3071E-14	-14.513
400.0	899.8	5.2012	7.8419	6.5845	6.6217		15.97	53.98	0.2061E-14	-14.686
420.0	899.9	4.8797	7.6811	6.3030	6.5814		15.61	55.57	0.1398E-14	-14.855
440.0	899.9	4.5601	7.5213	6.0232	6.5414		15.22	57.29	0.9566E-15	-15.019
460.0	900.0	4.2423	7.3625	5.7450	6.5017		14.81	59.25	0.6600E-15	-15.180
480.0	900.0	3.9265	7.2045	5.4685	6.4621		14.34	61.54	0.4589E-15	-15.338
500.0	900.0	3.6125	7.0475	5.1936	6.4228	4.7344	13.81	64.26	0.3216E-15	-15.493
520.0	900.0	3.3003	6.8914	4.9203	6.3838	4.7246	13.22	67.56	0.2271E-15	-15.644
540.0	900.0	2.9900	6.7363	4.6486	6.3449	4.7148	12.55	71.57	0.1617E-15	-15.791
560.0	900.0	2.6814	6.5820	4.3785	6.3063	4.7051	11.82	76.44	0.1161E-15	-15.935
580.0	900.0	2.3746	6.4286	4.1099	6.2680	4.6954	11.04	82.32	0.8429E-16	-16.074
600.0	900.0	2.0696	6.2761	3.8428	6.2298	4.6858	10.23	89.32	0.6186E-16	-16.209
620.0	900.0	1.7664	6.1245	3.5773	6.1918	4.6762	9.42	97.53	0.4598E-16	-16.337
640.0	900.0	1.4648	5.9737	3.3134	6.1541	4.6667	8.64	106.98	0.3466E-16	-16.460
660.0	900.0	1.1650	5.8238	3.0509	6.1166	4.6573	7.91	117.60	0.2653E-16	-16.576
680.0	900.0	0.8669	5.6747	2.7899	6.0793	4.6479	7.24	129.21	0.2064E-16	-16.685
700.0	900.0	0.5705	5.5265	2.5304	6.0422	4.6386	6.64	141.57	0.1634E-16	-16.787
750.0	900.0	-0.1633	5.1596	1.8880	5.9504	4.6154	5.50	173.45	0.9840E-17	-17.007
800.0	900.0	-0.8868	4.7979	1.2546	5.8559	4.5926	4.77	202.59	0.6549E-17	-17.184
850.0	900.0	-1.6002	4.4412	0.6300	5.7706	4.5702	4.34	225.97	0.4716E-17	-17.326
900.0	900.0	-2.3039	4.0893	0.0140	5.6826	4.5480	4.08	243.58	0.3586E-17	-17.445
950.0	900.0	-2.9979	3.7423	-0.5936	5.5957	4.5261	3.92	256.88	0.2824E-17	-17.549
1000.0	900.0	-3.6824	3.4001	-1.1929	5.5101	4.5046	3.82	267.49	0.2272E-17	-17.644

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 850 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.3751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	479.7	10.3664	10.5611	11.1405	7.4031		26.27	16.12	0.8630E-11	-11.064
140.0	573.0	9.9911	10.3349	10.8023	7.3180		25.68	19.76	0.4046E-11	-11.393
150.0	642.8	9.6839	10.1563	10.5271	7.2548		25.11	22.74	0.2203E-11	-11.657
160.0	695.0	9.4168	10.0058	10.2891	7.2046		24.55	25.23	0.1313E-11	-11.882
170.0	734.1	9.1754	9.8732	10.0747	7.1627		23.98	27.36	0.8355E-12	-12.078
180.0	763.3	8.9512	9.7527	9.8764	7.1262		23.42	29.22	0.5478E-12	-12.261
190.0	785.2	8.7392	9.6405	9.6892	7.0936		22.86	30.89	0.3727E-12	-12.429
200.0	801.5	8.5358	9.5343	9.5101	7.0638		22.31	32.41	0.2598E-12	-12.585
210.0	813.7	8.3388	9.4326	9.3368	7.0359		21.77	33.83	0.1846E-12	-12.734
220.0	822.9	8.1466	9.3340	9.1679	7.0094		21.24	35.16	0.1333E-12	-12.875
230.0	829.7	7.9580	9.2379	9.0023	6.9840		20.73	36.43	0.9760E-13	-13.011
240.0	834.8	7.7722	9.1437	8.8393	6.9595		20.25	37.65	0.7232E-13	-13.141
250.0	838.6	7.5886	9.0509	8.6783	6.9355		19.79	38.81	0.5416E-13	-13.266
260.0	841.5	7.4067	8.9592	8.5190	6.9120		19.36	39.94	0.4096E-13	-13.388
270.0	843.6	7.2264	8.8685	8.3609	6.8889		18.95	41.01	0.3125E-13	-13.505
280.0	845.2	7.0472	8.7785	8.2040	6.8661		18.58	42.04	0.2403E-13	-13.619
290.0	846.4	6.8691	8.6891	8.0479	6.8435		18.24	43.03	0.1862E-13	-13.730
300.0	847.3	6.6918	8.6003	7.8927	6.8211		17.92	43.97	0.1452E-13	-13.838
320.0	848.5	6.3398	8.4239	7.5844	6.7767		17.36	45.73	0.8994E-14	-14.046
340.0	849.2	5.9904	8.2491	7.2785	6.7329		16.87	47.35	0.5686E-14	-14.245
360.0	849.5	5.6435	8.0755	6.9748	6.6894		16.45	48.88	0.3656E-14	-14.437
380.0	849.7	5.2988	7.9031	6.6730	6.6462		16.06	50.39	0.2385E-14	-14.623
400.0	849.9	4.9563	7.7319	6.3731	6.6033		15.67	51.93	0.1574E-14	-14.803
420.0	849.9	4.6158	7.5616	6.0751	6.5607		15.27	53.61	0.1050E-14	-14.979
440.0	850.0	4.2774	7.3924	5.7788	6.5183		14.84	55.57	0.7068E-15	-15.151
460.0	850.0	3.9410	7.2242	5.4843	6.4762		14.34	57.78	0.4799E-15	-15.319
480.0	850.0	3.6066	7.0570	5.1915	6.4344		13.78	60.61	0.3286E-15	-15.483
500.0	850.0	3.2741	6.8907	4.9004	6.3928	4.9091	13.13	63.86	0.2269E-15	-15.644
520.0	850.0	2.9436	6.7255	4.6111	6.3514	4.8987	12.40	67.99	0.1582E-15	-15.801
540.0	850.0	2.6150	6.5612	4.3234	6.3103	4.8884	11.61	73.09	0.1114E-15	-15.953
560.0	850.0	2.2883	6.3978	4.0373	6.2694	4.8781	10.76	79.32	0.7940E-16	-16.100
580.0	850.0	1.9634	6.2354	3.7530	6.2288	4.8679	9.89	86.80	0.5733E-16	-16.242
600.0	850.0	1.6405	6.0739	3.4702	6.1884	4.8577	9.03	95.63	0.4201E-16	-16.377
620.0	850.0	1.3194	5.9134	3.1891	6.1482	4.8476	8.21	105.80	0.3130E-16	-16.504
640.0	850.0	1.0001	5.7537	2.9096	6.1083	4.8375	7.45	117.18	0.2375E-16	-16.624
660.0	850.0	0.6826	5.5950	2.6317	6.0685	4.8275	6.78	129.52	0.1837E-16	-16.736
680.0	850.0	0.3670	5.4372	2.3553	6.0290	4.8176	6.20	142.47	0.1450E-16	-16.839
700.0	850.0	0.0531	5.2803	2.0806	5.9898	4.8077	5.71	155.62	0.1167E-16	-16.933
750.0	850.0	-0.7238	4.8918	1.4004	5.8926	4.7832	4.82	186.71	0.7364E-17	-17.133
800.0	850.0	-1.4898	4.5088	0.7297	5.7967	4.7591	4.30	212.21	0.5116E-17	-17.291
850.0	850.0	-2.2453	4.1311	0.0684	5.7022	4.7353	4.00	231.40	0.3799E-17	-17.420
900.0	850.0	-2.9903	3.7586	-0.5839	5.6090	4.7118	3.82	245.88	0.2940E-17	-17.532
950.0	850.0	-3.7251	3.3911	-1.2272	5.5170	4.6886	3.70	257.56	0.2333E-17	-17.632
1000.0	850.0	-4.4499	3.0287	-1.8617	5.4263	4.6658	3.60	267.89	0.1880E-17	-17.726

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 800 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.7	13.4751	13.8808	11.4021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	467.4	10.3723	13.5697	11.1471	7.4055		26.26	15.71	0.8765E-11	-11.057
140.0	551.3	9.9925	13.3439	10.9356	7.3264		25.65	19.34	0.4082E-11	-11.389
150.0	614.1	9.6772	13.1629	10.7237	7.2638		25.05	21.78	0.2193E-11	-11.659
160.0	661.1	9.4036	13.0286	10.2775	7.2134		24.45	24.39	0.1286E-11	-11.891
170.0	696.1	9.1488	12.8715	10.0544	7.1708		23.85	26.39	0.7997E-12	-12.097
180.0	722.4	8.9141	12.7460	9.8468	7.1334		23.25	27.85	0.5186E-12	-12.285
190.0	742.0	8.6911	12.6288	9.6502	7.0998		22.65	29.45	0.3471E-12	-12.460
200.0	756.6	8.4768	12.5174	9.4615	7.0688		22.07	32.93	0.2381E-12	-12.623
210.0	767.6	8.2688	12.4102	9.2786	7.0396		21.50	32.31	0.1666E-12	-12.778
220.0	775.8	8.0655	12.3063	9.1001	7.0119		20.94	33.61	0.1186E-12	-12.926
230.0	781.9	7.8658	12.2047	8.9248	6.9853		20.42	34.86	0.8565E-13	-13.067
240.0	786.5	7.6689	12.1050	8.7521	6.9594		19.92	36.05	0.6265E-13	-13.203
250.0	791.9	7.4742	12.0067	8.5814	6.9341		19.45	37.19	0.4636E-13	-13.334
260.0	792.4	7.2813	11.9095	8.4124	6.9092		19.02	38.28	0.3466E-13	-13.460
270.0	794.3	7.0898	11.8133	8.2446	6.8848		18.61	39.32	0.2616E-13	-13.582
280.0	795.9	6.8996	11.7178	8.0780	6.8606		18.24	40.31	0.1971E-13	-13.701
290.0	796.8	6.7105	11.6230	7.9124	6.8366		17.91	41.25	0.1527E-13	-13.816
300.0	797.6	6.5223	11.5286	7.7475	6.8129		17.60	42.14	0.1179E-13	-13.928
320.0	798.7	6.1483	11.3414	7.4201	6.7658		17.05	43.81	0.7168E-14	-14.145
340.0	799.3	5.7772	11.1556	7.0951	6.7192		16.58	45.35	0.4447E-14	-14.352
360.0	799.6	5.4086	10.9713	6.7724	6.6730		16.16	46.84	0.2807E-14	-14.552
380.0	799.8	5.0424	10.7881	6.4518	6.6271		15.75	48.36	0.1797E-14	-14.745
400.0	799.9	4.6785	10.6061	6.1332	6.5816		15.33	49.99	0.1164E-14	-14.934
420.0	799.9	4.3168	10.4253	5.8165	6.5363		14.86	51.86	0.7619E-15	-15.118
440.0	800.0	3.9572	10.2455	5.5017	6.4913		14.33	54.10	0.5036E-15	-15.298
460.0	800.0	3.5998	10.0668	5.1888	6.4466		13.72	56.85	0.3363E-15	-15.474
480.0	800.0	3.2445	9.8891	4.8778	6.4021		13.01	60.29	0.2264E-15	-15.645
500.0	800.0	2.8912	9.7125	4.5685	6.3579	5.1019	12.21	64.62	0.1542E-15	-15.812
520.0	800.0	2.5400	9.5369	4.2610	6.3140	5.0908	11.33	70.04	0.1062E-15	-15.974
540.0	800.0	2.1909	9.3623	3.9554	6.2703	5.0798	10.40	76.75	0.7420E-16	-16.130
560.0	800.0	1.8437	9.1887	3.6515	6.2268	5.0689	9.46	84.90	0.5244E-16	-16.279
580.0	800.0	1.4986	9.0162	3.3493	6.1837	5.0580	8.54	94.57	0.3802E-16	-16.420
600.0	800.0	1.1555	8.8446	3.0489	6.1407	5.0472	7.69	105.69	0.2801E-16	-16.553
620.0	800.0	0.8143	8.6740	2.7502	6.0980	5.0365	6.92	118.06	0.2108E-16	-16.676
640.0	800.0	0.4751	8.5044	2.4532	6.0556	5.0258	6.26	131.32	0.1623E-16	-16.790
660.0	800.0	0.1378	8.3357	2.1579	6.0134	5.0152	5.70	144.99	0.1279E-16	-16.893
680.0	800.0	-0.1976	8.1681	1.8643	5.9714	5.0046	5.24	158.59	0.1031E-16	-16.987
700.0	800.0	-0.5311	8.0013	1.5724	5.9297	4.9941	4.87	171.65	0.8486E-17	-17.071
750.0	800.0	-1.3565	7.5886	0.8497	5.8264	4.9681	4.24	203.28	0.5644F-17	-17.248
800.0	800.0	-2.1705	7.1816	0.1371	5.7246	4.9424	3.88	221.73	0.4076F-17	-17.390
850.0	800.0	-2.9731	6.7803	-0.5655	5.6242	4.9172	3.66	238.19	0.3096E-17	-17.509
900.0	800.0	-3.7647	6.3845	-1.2585	5.5251	4.8922	3.51	251.73	0.2422F-17	-17.616
950.0	800.0	-4.5454	5.9941	-1.9421	5.4274	4.8676	3.39	264.10	0.1928E-17	-17.715
1000.0	800.0	-5.3156	5.6091	-2.6163	5.3311	4.8434	3.29	276.40	0.1552E-17	-17.809

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 750 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.9808	11.4321	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	454.5	10.4785	10.5789	11.1543	7.4162		26.25	15.23	0.4939E-11	-11.306
140.0	534.0	9.9936	10.3535	10.8088	7.3355		25.61	18.29	0.2418E-11	-11.385
150.0	594.7	9.6592	10.1695	10.5184	7.2734		24.98	20.79	0.2179E-11	-11.662
160.0	626.3	9.3816	10.0108	10.2639	7.2226		24.34	22.93	0.1254E-11	-11.902
170.0	657.5	9.1142	9.8685	10.0326	7.1792		23.70	24.80	0.7653E-12	-12.116
180.0	680.9	8.8712	9.7375	9.8125	7.1408		23.06	26.47	0.4868E-12	-12.313
190.0	698.3	8.6359	9.6143	9.6051	7.1059		22.42	28.00	0.3198E-12	-12.495
200.0	711.3	8.4090	9.4969	9.4055	7.0736		21.80	29.43	0.2154E-12	-12.667
210.0	721.0	8.1883	9.3836	9.2116	7.0436		21.20	30.78	0.1482E-12	-12.829
220.0	728.3	7.9724	9.2734	9.0220	7.0158		20.62	32.06	0.1038E-12	-12.984
230.0	733.8	7.7602	9.1656	8.8357	6.9897		20.07	33.28	0.7388E-13	-13.131
240.0	737.9	7.5506	9.0596	8.6519	6.9653		19.56	34.44	0.5329E-13	-13.273
250.0	740.9	7.3432	8.9551	8.4702	6.9424		19.09	35.55	0.3892E-13	-13.410
260.0	743.2	7.1377	8.8517	8.2901	6.9209		18.65	36.60	0.2874E-13	-13.542
270.0	744.9	6.9337	8.7492	8.1114	6.8996		18.26	37.60	0.2143E-13	-13.669
280.0	746.2	6.7309	8.6474	7.9338	6.8803		17.89	38.54	0.1612E-13	-13.793
290.0	747.2	6.5293	8.5463	7.7572	6.8618		17.56	39.43	0.1223E-13	-13.913
300.0	747.9	6.3286	8.4458	7.5815	6.8435		17.26	40.28	0.9365E-14	-14.029
320.0	748.8	5.9298	8.2461	7.2323	6.7523		16.73	41.85	0.5559E-14	-14.255
340.0	749.3	5.5340	8.0481	6.8857	6.7026		16.27	43.34	0.3377E-14	-14.471
360.0	749.6	5.1409	7.8514	6.5415	6.6534		15.83	44.83	0.2066E-14	-14.681
380.0	749.8	4.7503	7.6561	6.1996	6.6044		15.38	46.44	0.1307E-14	-14.884
400.0	749.9	4.3621	7.4620	5.8597	6.5558		14.88	48.28	0.8288E-15	-15.082
420.0	749.9	3.9763	7.2690	5.5219	6.5076		14.31	50.51	0.5313E-15	-15.275
440.0	750.0	3.5928	7.0773	5.1862	6.4596		13.63	53.32	0.3443E-15	-15.463
460.0	750.0	3.2115	6.8866	4.8524	6.4119		12.85	56.92	0.2255E-15	-15.647
480.0	750.0	2.8325	6.6971	4.5206	6.3644		11.95	61.55	0.1496E-15	-15.825
500.0	750.0	2.4557	6.5087	4.1907	6.3173	5.3155	10.97	67.47	0.1006E-15	-15.997
520.0	750.0	2.0811	6.3214	3.8628	6.2704	5.3037	9.93	74.91	0.6876E-16	-16.163
540.0	750.0	1.7087	6.1352	3.5367	6.2238	5.2922	8.91	84.05	0.4789E-16	-16.320
560.0	750.0	1.3384	5.9501	3.2125	6.1775	5.2803	7.93	94.94	0.3408E-16	-16.467
580.0	750.0	0.9703	5.7660	2.8902	6.1314	5.2687	7.05	107.45	0.2484E-16	-16.605
600.0	750.0	0.6042	5.5830	2.5698	6.0856	5.2572	6.28	121.23	0.1859E-16	-16.731
620.0	750.0	0.2403	5.4010	2.2512	6.0401	5.2457	5.64	135.77	0.1428E-16	-16.845
640.0	750.0	-0.1215	5.2201	1.9344	5.9948	5.2343	5.12	150.46	0.1127E-16	-16.948
660.0	750.0	-0.4613	5.0402	1.6195	5.9498	5.2230	4.70	164.73	0.9118E-17	-17.040
680.0	750.0	-0.8000	4.8614	1.3063	5.9050	5.2117	4.37	178.14	0.7566E-17	-17.122
700.0	750.0	-1.1367	4.6835	0.9949	5.8605	5.2005	4.12	190.42	0.6370E-17	-17.196
750.0	750.0	-2.0752	4.2433	0.2240	5.7504	5.1727	3.68	215.94	0.4456E-17	-17.351
800.0	750.0	-2.7434	3.8092	-0.5361	5.6417	5.1454	3.42	235.68	0.3319E-17	-17.479
850.0	750.0	-3.7996	3.3811	-1.2856	5.5346	5.1184	3.24	252.39	0.2560E-17	-17.592
900.0	750.0	-4.6439	2.9589	-2.0248	5.4290	5.0918	3.09	268.19	0.2016E-17	-17.696
950.0	750.0	-5.4767	2.5425	-2.7539	5.3248	5.0656	2.95	284.40	0.1608E-17	-17.794
1000.0	750.0	-6.2982	2.1318	-3.4731	5.2220	5.0397	2.82	301.77	0.1295E-17	-17.888

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 700 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8898	11.6221	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	441.4	10.3850	10.5885	11.1612	7.4233		26.24	14.85	0.9062E-11	-11.043
140.0	506.2	9.9944	10.3634	10.8119	7.3450		25.58	17.53	0.4156E-11	-11.382
150.0	554.8	9.6597	10.1762	10.5139	7.2835		24.90	19.79	0.2160E-11	-11.666
160.0	591.7	9.3598	10.0124	10.2479	7.2323		24.22	21.75	0.1218E-11	-11.914
170.0	618.4	9.0829	9.8642	10.0031	7.1879		23.53	23.49	0.7272E-12	-12.138
180.0	638.9	8.8220	9.7267	9.7729	7.1483		22.84	25.07	0.4527E-12	-12.344
190.0	654.2	8.5725	9.5968	9.5532	7.1120		22.16	26.55	0.2912E-12	-12.536
200.0	665.7	8.3312	9.4724	9.3410	7.0781		21.50	27.93	0.1923E-12	-12.716
210.0	674.3	8.0961	9.3520	9.1344	7.0459		20.86	29.24	0.1298E-12	-12.887
220.0	680.7	7.8656	9.2347	8.9322	7.0150		20.26	30.49	0.8936E-13	-13.049
230.0	685.5	7.6387	9.1197	8.7332	6.9851		19.70	31.68	0.6254E-13	-13.204
240.0	689.2	7.4147	9.0066	8.5367	6.9559		19.18	32.81	0.4492E-13	-13.352
250.0	691.9	7.1929	8.8948	8.3424	6.9273		18.70	33.88	0.3197E-13	-13.495
260.0	693.9	6.9730	8.7842	8.1497	6.8992		18.27	34.89	0.2328E-13	-13.633
270.0	695.4	6.7546	8.6746	7.9584	6.8714		17.88	35.83	0.1714E-13	-13.766
280.0	696.6	6.5375	8.5657	7.7682	6.8439		17.53	36.73	0.1273E-13	-13.895
290.0	697.4	6.3216	8.4574	7.5791	6.8166		17.21	37.57	0.9537E-14	-14.021
300.0	698.1	6.1066	8.3498	7.3909	6.7895		16.92	38.37	0.7198E-14	-14.143
320.0	698.9	5.6794	8.1359	7.0168	6.7358		16.39	39.88	0.4178E-14	-14.379
340.0	699.4	5.2554	7.9237	6.6455	6.6826		15.91	41.37	0.2477E-14	-14.606
360.0	699.7	4.8342	7.7131	6.2768	6.6298		15.42	42.96	0.1493E-14	-14.826
380.0	699.8	4.4157	7.5038	5.9104	6.5774		14.88	44.80	0.9125E-15	-15.040
400.0	699.9	3.9998	7.2958	5.5463	6.5253		14.24	47.08	0.5648E-15	-15.248
420.0	699.9	3.5864	7.0891	5.1844	6.4736		13.48	50.03	0.3539E-15	-15.451
440.0	700.0	3.1755	6.8836	4.8246	6.4222		12.58	53.92	0.2246E-15	-15.649
460.0	700.0	2.7670	6.6794	4.4670	6.3711		11.55	59.07	0.1446E-15	-15.840
480.0	700.0	2.3610	6.4763	4.1115	6.3203		10.43	65.81	0.9468E-16	-16.024
500.0	700.0	1.9572	6.2745	3.7581	6.2697	5.5534	9.27	74.46	0.6322E-16	-16.199
520.0	700.0	1.5559	6.0738	3.4067	6.2195	5.5407	8.15	85.21	0.4321E-16	-16.364
540.0	700.0	1.1569	5.8743	3.0573	6.1696	5.5282	7.12	98.09	0.3033E-16	-16.518
560.0	700.0	0.7601	5.6759	2.7100	6.1200	5.5157	6.23	112.81	0.2193E-16	-16.659
580.0	700.0	0.3657	5.4787	2.3647	6.0706	5.5032	5.49	128.81	0.1636E-16	-16.786
600.0	700.0	-0.0265	5.2826	2.0214	6.0215	5.4909	4.89	145.38	0.1260E-16	-16.900
620.0	700.0	-0.4164	5.0877	1.6800	5.9728	5.4786	4.42	161.73	0.1000E-16	-17.000
640.0	700.0	-0.8041	4.8938	1.3406	5.9242	5.4664	4.06	177.26	0.8155E-17	-17.089
660.0	700.0	-1.1895	4.7011	1.0031	5.8760	5.4542	3.77	191.60	0.6808E-17	-17.167
680.0	700.0	-1.5728	4.5094	0.6676	5.8281	5.4422	3.55	204.60	0.5797E-17	-17.237
700.0	700.0	-1.9539	4.3189	0.3339	5.7804	5.4302	3.38	216.14	0.5014E-17	-17.300
750.0	700.0	-2.8973	3.8472	-0.4920	5.6623	5.4004	3.07	241.44	0.3663E-17	-17.436
800.0	700.0	-3.8275	3.3821	-1.3063	5.5459	5.3711	2.86	263.26	0.2794E-17	-17.554
850.0	700.0	-4.7448	2.9234	-2.1094	5.4312	5.3422	2.68	284.45	0.2184E-17	-17.661
900.0	700.0	-5.6495	2.4711	-2.9014	5.3180	5.3137	2.52	306.55	0.1735E-17	-17.761
950.0	700.0	-6.5418	2.0250	-3.6826	5.2063	5.2856	2.37	330.33	0.1395E-17	-17.855
1000.0	700.0	-7.4219	1.5849	-4.4531	5.0962	5.2579	2.23	356.12	0.1134E-17	-17.945

TABLE 1.—Detailed atmospheric data as a function of height and exospheric temperature—Continued

EXOSPHERIC TEMPERATURE = 650 DEGREES

HEIGHT KM	TEMP DEG K	LOG N(O2) /CM3	LOG N(O) /CM3	LOG N(N2) /CM3	LOG N(HE) /CM3	LOG N(H) /CM3	MEAN MOL WT	SCALE HT KM	DENSITY GM/CM3	LOG DEN GM/CM3
120.0	355.0	10.8751	10.8808	11.6021	7.5315		26.90	11.62	0.2461E-10	-10.609
130.0	428.2	10.3916	10.5984	11.1687	7.4307		26.23	14.42	0.9222E-11	-11.035
140.0	483.3	9.9948	10.3737	10.8147	7.3550		25.53	16.76	0.4189E-11	-11.378
150.0	524.7	9.6686	10.1828	10.5072	7.2941		24.82	18.78	0.2137E-11	-11.670
160.0	555.8	9.3348	10.0133	10.2293	7.2424		24.08	20.56	0.1178E-11	-11.929
170.0	579.2	9.0426	9.8583	9.9714	7.1970		23.34	22.18	0.6859E-12	-12.164
180.0	596.7	8.7658	9.7134	9.7273	7.1559		22.60	23.67	0.4167E-12	-12.380
190.0	610.0	8.4998	9.5757	9.4933	7.1188		21.87	25.08	0.2617E-12	-12.582
200.0	619.9	8.2420	9.4432	9.2667	7.0822		21.16	26.42	0.1690E-12	-12.772
210.0	627.4	7.9902	9.3147	9.0456	7.0481		20.49	27.70	0.1118E-12	-12.952
220.0	633.0	7.7430	9.1892	8.8287	7.0153		19.87	28.91	0.7543E-13	-13.122
230.0	637.2	7.4996	9.0659	8.6151	6.9834		19.29	30.07	0.5184E-13	-13.285
240.0	640.4	7.2586	8.9445	8.4040	6.9522		18.77	31.16	0.3620E-13	-13.441
250.0	642.8	7.0201	8.8244	8.1951	6.9215		18.29	32.19	0.2563E-13	-13.591
260.0	644.6	6.7835	8.7055	7.9878	6.8913		17.87	33.14	0.1838E-13	-13.736
270.0	645.9	6.5485	8.5876	7.7819	6.8615		17.49	34.04	0.1333E-13	-13.875
280.0	646.9	6.3149	8.4704	7.5773	6.8319		17.14	34.88	0.9761E-14	-14.011
290.0	647.7	6.0824	8.3539	7.3737	6.8026		16.83	35.69	0.7209E-14	-14.142
300.0	648.3	5.8510	8.2380	7.1711	6.7734		16.54	36.45	0.5364E-14	-14.271
320.0	649.0	5.3910	8.0078	6.7683	6.7156		15.99	37.97	0.3026E-14	-14.519
340.0	649.4	4.9344	7.7793	6.3685	6.6584		15.44	39.58	0.1743E-14	-14.759
360.0	649.7	4.4808	7.5524	5.9714	6.6015		14.83	41.47	0.1021E-14	-14.991
380.0	649.8	4.0301	7.3271	5.5768	6.5451		14.10	43.90	0.6069E-15	-15.217
400.0	649.9	3.5823	7.1031	5.1847	6.4890		13.20	47.15	0.3660E-15	-15.437
420.0	649.9	3.1371	6.8805	4.7950	6.4333		12.13	51.62	0.2240E-15	-15.650
440.0	650.0	2.6946	6.6592	4.4076	6.3779		10.91	57.75	0.1395E-15	-15.855
460.0	650.0	2.2547	6.4393	4.0224	6.3229		9.60	66.04	0.8870E-16	-16.052
480.0	650.0	1.8173	6.2206	3.6396	6.2682		8.29	76.92	0.5782E-16	-16.238
500.0	650.0	1.3826	6.0032	3.2589	6.2138	5.8199	7.07	90.63	0.3883E-16	-16.411
520.0	650.0	0.9503	5.7871	2.8805	6.1597	5.8063	6.02	107.07	0.2698E-16	-16.569
540.0	650.0	0.5206	5.5722	2.5043	6.1059	5.7927	5.16	125.67	0.1946E-16	-16.711
560.0	650.0	0.0934	5.3586	2.1303	6.0525	5.7793	4.48	145.53	0.1458E-16	-16.836
580.0	650.0	-0.3314	5.1462	1.7584	5.9993	5.7659	3.97	165.49	0.1134E-16	-16.946
600.0	650.0	-0.7537	4.9351	1.3887	5.9465	5.7526	3.57	184.70	0.9113E-17	-17.040
620.0	650.0	-1.1736	4.7251	1.0211	5.8939	5.7394	3.28	202.56	0.7537E-17	-17.123
640.0	650.0	-1.5911	4.5164	0.6556	5.8417	5.7262	3.05	218.85	0.6381E-17	-17.195
660.0	650.0	-2.0063	4.3088	0.2921	5.7897	5.7131	2.87	233.65	0.5502E-17	-17.259
680.0	650.0	-2.4190	4.1024	-0.0692	5.7381	5.7001	2.73	247.21	0.4813E-17	-17.318
700.0	650.0	-2.8295	3.8972	-0.4286	5.6867	5.6872	2.61	259.82	0.4256E-17	-17.371
750.0	650.0	-3.8454	3.3892	-1.3180	5.5596	5.6552	2.38	289.07	0.3233E-17	-17.490
800.0	650.0	-4.8472	2.8883	-2.1950	5.4343	5.6236	2.20	317.51	0.2531E-17	-17.597
850.0	650.0	-5.8351	2.3944	-3.0599	5.3107	5.5925	2.04	346.84	0.2021E-17	-17.694
900.0	650.0	-6.8093	1.9073	-3.9128	5.1888	5.5618	1.90	377.64	0.1639E-17	-17.785
950.0	650.0	-7.7702	1.4268	-4.7541	5.0686	5.5315	1.78	409.90	0.1348E-17	-17.870
1000.0	650.0	-8.7181	0.9529	-5.5839	4.9500	5.5017	1.67	443.29	0.1124E-17	-17.949

TABLE 2.—Densities as a function of height and exospheric temperature (decimal logarithms, g/cm³)

$z \backslash T_\infty$	2100	2050	2000	1950	1900	1850	1800	1750	1700	1650	1600	1550	1500	1450	1400
120	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609
130	-11.113	-11.112	-11.112	-11.112	-11.112	-11.111	-11.111	-11.111	-11.111	-11.111	-11.110	-11.110	-11.109	-11.108	-11.107
140	-11.438	-11.437	-11.436	-11.436	-11.435	-11.435	-11.434	-11.433	-11.433	-11.432	-11.431	-11.430	-11.429	-11.427	-11.426
150	-11.679	-11.678	-11.677	-11.676	-11.675	-11.675	-11.674	-11.673	-11.671	-11.670	-11.669	-11.668	-11.666	-11.665	-11.663
160	-11.871	-11.870	-11.870	-11.869	-11.868	-11.866	-11.865	-11.864	-11.863	-11.861	-11.860	-11.859	-11.857	-11.856	-11.855
170	-12.032	-12.031	-12.031	-12.030	-12.029	-12.027	-12.026	-12.025	-12.024	-12.022	-12.021	-12.020	-12.019	-12.018	-12.018
180	-12.171	-12.170	-12.170	-12.169	-12.168	-12.167	-12.166	-12.164	-12.163	-12.162	-12.161	-12.160	-12.160	-12.160	-12.161
190	-12.293	-12.293	-12.293	-12.292	-12.291	-12.291	-12.290	-12.289	-12.288	-12.287	-12.286	-12.286	-12.286	-12.288	-12.289
200	-12.404	-12.404	-12.404	-12.403	-12.403	-12.402	-12.402	-12.401	-12.400	-12.400	-12.400	-12.401	-12.402	-12.404	-12.407
210	-12.504	-12.505	-12.505	-12.505	-12.505	-12.505	-12.504	-12.504	-12.504	-12.504	-12.505	-12.507	-12.509	-12.512	-12.517
220	-12.597	-12.598	-12.599	-12.599	-12.599	-12.600	-12.600	-12.601	-12.602	-12.603	-12.606	-12.609	-12.614	-12.620	
230	-12.683	-12.685	-12.686	-12.687	-12.688	-12.688	-12.689	-12.690	-12.691	-12.693	-12.696	-12.699	-12.704	-12.710	-12.718
240	-12.764	-12.766	-12.768	-12.769	-12.771	-12.772	-12.774	-12.775	-12.777	-12.780	-12.784	-12.788	-12.794	-12.802	-12.811
250	-12.841	-12.843	-12.845	-12.848	-12.850	-12.852	-12.854	-12.856	-12.859	-12.863	-12.868	-12.874	-12.881	-12.890	-12.901
260	-12.913	-12.917	-12.919	-12.922	-12.925	-12.927	-12.930	-12.934	-12.938	-12.943	-12.948	-12.955	-12.964	-12.975	-12.988
270	-12.983	-12.987	-12.990	-12.993	-12.997	-13.000	-13.004	-13.009	-13.013	-13.019	-13.026	-13.035	-13.045	-13.057	-13.072
280	-13.049	-13.054	-13.058	-13.062	-13.066	-13.070	-13.075	-13.080	-13.086	-13.093	-13.101	-13.111	-13.123	-13.137	-13.153
290	-13.114	-13.119	-13.123	-13.128	-13.133	-13.138	-13.144	-13.150	-13.157	-13.165	-13.175	-13.186	-13.199	-13.214	-13.233
300	-13.175	-13.181	-13.187	-13.192	-13.198	-13.204	-13.210	-13.217	-13.226	-13.235	-13.246	-13.258	-13.273	-13.290	-13.310
310	-13.235	-13.242	-13.248	-13.254	-13.261	-13.268	-13.275	-13.283	-13.292	-13.303	-13.315	-13.329	-13.345	-13.364	-13.386
320	-13.293	-13.301	-13.308	-13.315	-13.322	-13.330	-13.338	-13.347	-13.358	-13.369	-13.383	-13.398	-13.416	-13.436	-13.460
330	-13.353	-13.358	-13.366	-13.373	-13.382	-13.390	-13.400	-13.410	-13.421	-13.434	-13.449	-13.466	-13.485	-13.507	-13.532
340	-13.405	-13.414	-13.422	-13.431	-13.440	-13.449	-13.460	-13.471	-13.484	-13.498	-13.514	-13.532	-13.553	-13.576	-13.603
350	-13.459	-13.468	-13.477	-13.487	-13.497	-13.507	-13.519	-13.531	-13.545	-13.562	-13.577	-13.597	-13.619	-13.644	-13.673
360	-13.511	-13.521	-13.531	-13.542	-13.553	-13.564	-13.576	-13.590	-13.604	-13.621	-13.640	-13.662	-13.684	-13.711	-13.741
370	-13.563	-13.573	-13.584	-13.596	-13.607	-13.620	-13.633	-13.647	-13.663	-13.681	-13.701	-13.723	-13.748	-13.776	-13.808
380	-13.613	-13.625	-13.636	-13.648	-13.661	-13.674	-13.688	-13.704	-13.721	-13.740	-13.761	-13.786	-13.811	-13.841	-13.874
390	-13.662	-13.675	-13.687	-13.700	-13.713	-13.728	-13.743	-13.759	-13.778	-13.798	-13.820	-13.845	-13.873	-13.904	-13.939
400	-13.711	-13.724	-13.737	-13.751	-13.765	-13.780	-13.796	-13.814	-13.833	-13.854	-13.878	-13.904	-13.933	-13.966	-14.003
410	-13.759	-13.772	-13.786	-13.801	-13.816	-13.832	-13.849	-13.868	-13.888	-13.910	-13.935	-13.963	-13.993	-14.027	-14.065
420	-13.805	-13.820	-13.835	-13.850	-13.866	-13.883	-13.901	-13.921	-13.942	-13.966	-13.992	-14.020	-14.052	-14.088	-14.127
430	-13.851	-13.867	-13.882	-13.898	-13.915	-13.933	-13.952	-13.973	-13.995	-14.020	-14.047	-14.077	-14.110	-14.147	-14.188
440	-13.897	-13.913	-13.929	-13.946	-13.964	-13.982	-14.002	-14.024	-14.048	-14.073	-14.101	-14.133	-14.167	-14.206	-14.248
450	-13.941	-13.958	-13.975	-13.993	-14.011	-14.031	-14.052	-14.075	-14.099	-14.126	-14.156	-14.188	-14.224	-14.263	-14.307
460	-13.985	-14.003	-14.021	-14.039	-14.059	-14.079	-14.101	-14.125	-14.150	-14.178	-14.209	-14.242	-14.279	-14.320	-14.365
470	-14.029	-14.047	-14.065	-14.085	-14.105	-14.126	-14.149	-14.174	-14.200	-14.229	-14.261	-14.296	-14.334	-14.376	-14.423
480	-14.072	-14.090	-14.110	-14.130	-14.151	-14.173	-14.197	-14.222	-14.250	-14.280	-14.313	-14.349	-14.388	-14.432	-14.480
490	-14.114	-14.133	-14.153	-14.174	-14.196	-14.219	-14.244	-14.270	-14.299	-14.330	-14.364	-14.401	-14.442	-14.487	-14.536
500	-14.156	-14.176	-14.197	-14.218	-14.241	-14.265	-14.290	-14.318	-14.347	-14.380	-14.415	-14.453	-14.495	-14.541	-14.592
510	-14.197	-14.218	-14.239	-14.261	-14.285	-14.310	-14.336	-14.365	-14.395	-14.428	-14.464	-14.504	-14.547	-14.595	-14.647
520	-14.237	-14.259	-14.281	-14.304	-14.329	-14.354	-14.382	-14.411	-14.442	-14.477	-14.514	-14.554	-14.599	-14.648	-14.701
530	-14.278	-14.300	-14.323	-14.347	-14.372	-14.398	-14.426	-14.457	-16.489	-16.524	-14.563	-14.604	-14.650	-14.700	-14.755
540	-14.317	-14.340	-14.364	-14.389	-14.414	-14.442	-14.471	-14.502	-14.535	-14.572	-14.611	-14.656	-14.701	-14.752	-14.808
550	-14.357	-14.380	-14.405	-14.430	-14.457	-14.485	-14.515	-14.547	-14.581	-14.618	-14.659	-14.703	-14.751	-14.803	-14.861

TABLE 2.—Densities as a function of height and exospheric temperature (decimal logarithms, g/cm³)—Continued

$z\sqrt{T_\infty}$	2100	2050	2000	1950	1900	1850	1800	1750	1700	1650	1600	1550	1500	1450	1400
560	-14.396	-14.423	-14.449	-14.471	-14.498	-14.527	-14.557	-14.591	-14.626	-14.665	-14.706	-14.751	-14.801	-14.854	-14.913
570	-14.434	-14.459	-14.485	-14.511	-14.542	-14.569	-14.601	-14.635	-14.671	-14.711	-14.753	-14.799	-14.850	-14.905	-14.965
580	-14.472	-14.498	-14.524	-14.552	-14.581	-14.611	-14.644	-14.679	-14.716	-14.756	-14.800	-14.847	-14.899	-14.955	-15.016
590	-14.510	-14.536	-14.563	-14.591	-14.621	-14.652	-14.686	-14.721	-14.760	-14.801	-14.846	-14.894	-14.947	-15.004	-15.067
600	-14.547	-14.574	-14.602	-14.631	-14.661	-14.693	-14.728	-14.764	-14.803	-14.846	-14.891	-14.941	-14.995	-15.054	-15.118
610	-14.584	-14.612	-14.643	-14.670	-14.701	-14.734	-14.769	-14.806	-14.846	-14.890	-14.936	-14.987	-15.042	-15.102	-15.168
620	-14.621	-14.649	-14.678	-14.708	-14.740	-14.774	-14.810	-14.848	-14.889	-14.934	-14.981	-15.034	-15.089	-15.151	-15.218
630	-14.657	-14.686	-14.716	-14.747	-14.779	-14.814	-14.851	-14.890	-14.932	-14.977	-15.026	-15.079	-15.136	-15.199	-15.267
640	-14.693	-14.722	-14.753	-14.785	-14.818	-14.853	-14.891	-14.931	-14.974	-15.020	-15.070	-15.124	-15.183	-15.246	-15.316
650	-14.728	-14.759	-14.790	-14.822	-14.857	-14.893	-14.931	-14.972	-15.016	-15.063	-15.114	-15.169	-15.229	-15.294	-15.364
660	-14.764	-14.795	-14.826	-14.860	-14.895	-14.932	-14.971	-15.012	-15.057	-15.105	-15.157	-15.213	-15.274	-15.340	-15.412
670	-14.799	-14.830	-14.863	-14.897	-14.932	-14.970	-15.010	-15.053	-15.098	-15.147	-15.200	-15.258	-15.320	-15.387	-15.460
680	-14.834	-14.866	-14.899	-14.934	-14.970	-15.008	-15.049	-15.093	-15.139	-15.189	-15.243	-15.301	-15.365	-15.433	-15.508
690	-14.868	-14.901	-14.935	-14.972	-15.007	-15.046	-15.088	-15.132	-15.180	-15.231	-15.286	-15.345	-15.409	-15.479	-15.555
700	-14.902	-14.936	-14.970	-15.006	-15.044	-15.084	-15.126	-15.172	-15.220	-15.272	-15.328	-15.388	-15.454	-15.524	-15.601
710	-14.936	-14.970	-15.005	-15.042	-15.081	-15.122	-15.165	-15.211	-15.260	-15.313	-15.370	-15.431	-15.498	-15.570	-15.648
720	-14.970	-15.005	-15.040	-15.078	-15.117	-15.159	-15.203	-15.250	-15.300	-15.353	-15.411	-15.474	-15.541	-15.614	-15.693
730	-15.004	-15.039	-15.075	-15.113	-15.153	-15.196	-15.240	-15.288	-15.339	-15.394	-15.453	-15.516	-15.585	-15.659	-15.739
740	-15.037	-15.072	-15.110	-15.149	-15.189	-15.232	-15.278	-15.326	-15.378	-15.434	-15.494	-15.558	-15.628	-15.703	-15.784
750	-15.070	-15.106	-15.144	-15.183	-15.225	-15.269	-15.315	-15.364	-15.417	-15.474	-15.534	-15.600	-15.670	-15.746	-15.829
760	-15.103	-15.139	-15.178	-15.218	-15.260	-15.305	-15.352	-15.402	-15.456	-15.513	-15.575	-15.641	-15.713	-15.790	-15.873
770	-15.135	-15.173	-15.212	-15.253	-15.295	-15.341	-15.389	-15.440	-15.494	-15.552	-15.615	-15.682	-15.755	-15.833	-15.917
780	-15.167	-15.206	-15.245	-15.287	-15.330	-15.376	-15.425	-15.477	-15.532	-15.591	-15.655	-15.723	-15.796	-15.875	-15.961
790	-15.200	-15.238	-15.279	-15.321	-15.365	-15.412	-15.461	-15.514	-15.570	-15.630	-15.694	-15.763	-15.838	-15.918	-16.004
800	-15.231	-15.271	-15.312	-15.355	-15.400	-15.447	-15.497	-15.551	-15.607	-15.668	-15.734	-15.803	-15.879	-15.960	-16.046
810	-15.263	-15.303	-15.345	-15.388	-15.434	-15.482	-15.533	-15.587	-15.645	-15.706	-15.772	-15.843	-15.919	-16.001	-16.089
820	-15.295	-15.335	-15.377	-15.422	-15.468	-15.517	-15.568	-15.623	-15.682	-15.744	-15.811	-15.883	-15.960	-16.042	-16.130
830	-15.326	-15.367	-15.410	-15.455	-15.502	-15.551	-15.604	-15.659	-15.719	-15.782	-15.849	-15.922	-16.000	-16.083	-16.172
840	-15.357	-15.399	-15.442	-15.488	-15.535	-15.586	-15.639	-15.695	-15.755	-15.819	-15.887	-15.961	-16.039	-16.123	-16.213
850	-15.388	-15.430	-15.474	-15.520	-15.569	-15.620	-15.673	-15.731	-15.791	-15.856	-15.925	-15.999	-16.078	-16.163	-16.253
860	-15.419	-15.462	-15.506	-15.553	-15.602	-15.653	-15.708	-15.766	-15.827	-15.893	-15.963	-16.037	-16.117	-16.202	-16.293
870	-15.449	-15.493	-15.538	-15.585	-15.635	-15.687	-15.742	-15.801	-15.863	-15.929	-16.000	-16.075	-16.155	-16.241	-16.332
880	-15.480	-15.524	-15.569	-15.617	-15.668	-15.720	-15.776	-15.835	-15.898	-15.965	-16.036	-16.112	-16.193	-16.279	-16.371
890	-15.511	-15.554	-15.601	-15.649	-15.700	-15.754	-15.810	-15.870	-15.933	-16.001	-16.073	-16.149	-16.231	-16.317	-16.409
900	-15.542	-15.585	-15.632	-15.681	-15.732	-15.787	-15.844	-15.904	-15.968	-16.037	-16.109	-16.186	-16.268	-16.355	-16.446
910	-15.573	-15.615	-15.663	-15.712	-15.764	-15.819	-15.877	-15.938	-16.003	-16.072	-16.145	-16.222	-16.305	-16.392	-16.483
920	-15.599	-15.645	-15.693	-15.744	-15.796	-15.852	-15.910	-15.972	-16.037	-16.107	-16.180	-16.258	-16.341	-16.428	-16.520
930	-15.629	-15.675	-15.724	-15.775	-15.829	-15.884	-15.943	-16.006	-16.071	-16.141	-16.215	-16.294	-16.376	-16.464	-16.556
940	-15.658	-15.705	-15.754	-15.806	-15.860	-15.916	-15.976	-16.038	-16.105	-16.175	-16.250	-16.329	-16.412	-16.499	-16.591
950	-15.687	-15.735	-15.784	-15.836	-15.891	-15.948	-16.008	-16.071	-16.138	-16.209	-16.284	-16.363	-16.447	-16.534	-16.625
960	-15.716	-15.764	-15.814	-15.867	-15.922	-15.979	-16.040	-16.104	-16.171	-16.243	-16.318	-16.397	-16.481	-16.568	-16.659
970	-15.745	-15.793	-15.844	-15.897	-15.953	-16.011	-16.072	-16.136	-16.204	-16.276	-16.351	-16.431	-16.515	-16.602	-16.693
980	-15.773	-15.822	-15.874	-15.927	-15.983	-16.042	-16.103	-16.168	-16.237	-16.309	-16.385	-16.466	-16.548	-16.635	-16.725
990	-15.802	-15.851	-15.903	-15.957	-16.013	-16.073	-16.135	-16.200	-16.269	-16.341	-16.417	-16.497	-16.581	-16.667	-16.757
1000	-15.830	-15.880	-15.932	-15.987	-16.044	-16.103	-16.166	-16.231	-16.301	-16.373	-16.449	-16.529	-16.613	-16.699	-16.788

TABLE 2.—Densities as a function of height and exospheric temperature (decimal logarithms, g/cm³)—Continued

$\frac{z-z_0}{z_\infty}$	1350	1300	1250	1200	1150	1100	1050	1000	950	900	850	800	750	700	650
120	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609	-10.609
130	-11.105	-11.103	-11.101	-11.098	-11.095	-11.091	-11.086	-11.082	-11.076	-11.070	-11.064	-11.057	-11.050	-11.043	-11.035
140	-11.424	-11.422	-11.419	-11.417	-11.414	-11.411	-11.408	-11.404	-11.421	-11.397	-11.393	-11.389	-11.385	-11.382	-11.378
150	-11.662	-11.660	-11.659	-11.658	-11.657	-11.656	-11.655	-11.655	-11.655	-11.656	-11.657	-11.659	-11.662	-11.666	-11.670
160	-11.855	-11.854	-11.854	-11.854	-11.856	-11.857	-11.860	-11.864	-11.868	-11.874	-11.882	-11.891	-11.902	-11.914	-11.929
170	-12.018	-12.019	-12.021	-12.023	-12.027	-12.032	-12.038	-12.045	-12.055	-12.067	-12.081	-12.097	-12.116	-12.138	-12.164
180	-12.162	-12.165	-12.169	-12.173	-12.179	-12.187	-12.197	-12.209	-12.224	-12.241	-12.261	-12.285	-12.313	-12.344	-12.380
190	-12.292	-12.296	-12.302	-12.309	-12.318	-12.329	-12.343	-12.359	-12.379	-12.402	-12.429	-12.460	-12.495	-12.536	-12.582
200	-12.412	-12.417	-12.425	-12.435	-12.447	-12.461	-12.479	-12.499	-12.524	-12.552	-12.585	-12.623	-12.667	-12.716	-12.772
210	-12.523	-12.531	-12.543	-12.553	-12.568	-12.586	-12.607	-12.632	-12.661	-12.695	-12.736	-12.778	-12.829	-12.887	-12.952
220	-12.628	-12.637	-12.650	-12.664	-12.682	-12.704	-12.729	-12.758	-12.792	-12.831	-12.875	-12.926	-12.984	-13.049	-13.122
230	-12.727	-12.739	-12.754	-12.771	-12.792	-12.817	-12.845	-12.878	-12.917	-12.961	-13.011	-13.067	-13.131	-13.204	-13.285
240	-12.823	-12.837	-12.854	-12.874	-12.897	-12.925	-12.957	-12.995	-13.037	-13.086	-13.141	-13.203	-13.273	-13.352	-13.441
250	-12.914	-12.931	-12.950	-12.973	-12.999	-13.030	-13.066	-13.107	-13.153	-13.206	-13.266	-13.334	-13.410	-13.495	-13.591
260	-13.001	-13.021	-13.043	-13.068	-13.098	-13.132	-13.171	-13.215	-13.266	-13.323	-13.388	-13.460	-13.542	-13.633	-13.736
270	-13.089	-13.110	-13.134	-13.161	-13.194	-13.231	-13.273	-13.321	-13.375	-13.436	-13.505	-13.582	-13.669	-13.766	-13.875
280	-13.173	-13.195	-13.221	-13.252	-13.287	-13.327	-13.372	-13.423	-13.481	-13.546	-13.619	-13.701	-13.793	-13.895	-14.011
290	-13.254	-13.279	-13.307	-13.340	-13.378	-13.420	-13.469	-13.523	-13.584	-13.653	-13.730	-13.816	-13.913	-14.021	-14.142
300	-13.333	-13.360	-13.391	-13.426	-13.466	-13.512	-13.563	-13.622	-13.685	-13.757	-13.838	-13.928	-14.029	-14.143	-14.271
310	-13.411	-13.440	-13.473	-13.510	-13.553	-13.601	-13.655	-13.715	-13.783	-13.859	-13.943	-14.038	-14.143	-14.262	-14.396
320	-13.487	-13.518	-13.553	-13.592	-13.637	-13.688	-13.744	-13.808	-13.879	-13.958	-14.046	-14.145	-14.255	-14.379	-14.519
330	-13.561	-13.594	-13.631	-13.673	-13.720	-13.773	-13.832	-13.899	-13.972	-14.055	-14.147	-14.247	-14.364	-14.494	-14.640
340	-13.634	-13.668	-13.708	-13.752	-13.801	-13.856	-13.918	-13.987	-14.064	-14.150	-14.245	-14.352	-14.471	-14.606	-14.759
350	-13.705	-13.742	-13.783	-13.829	-13.881	-13.938	-14.003	-14.074	-14.154	-14.243	-14.342	-14.453	-14.577	-14.717	-14.876
360	-13.775	-13.813	-13.856	-13.905	-13.958	-14.019	-14.085	-14.160	-14.242	-14.334	-14.437	-14.552	-14.681	-14.826	-14.991
370	-13.844	-13.884	-13.929	-13.979	-14.035	-14.097	-14.167	-14.243	-14.329	-14.424	-14.530	-14.647	-14.783	-14.934	-15.105
380	-13.911	-13.953	-14.000	-14.052	-14.110	-14.175	-14.246	-14.326	-14.414	-14.513	-14.623	-14.745	-14.884	-15.040	-15.217
390	-13.978	-14.021	-14.070	-14.124	-14.184	-14.251	-14.325	-14.407	-14.498	-14.600	-14.713	-14.840	-14.983	-15.145	-15.327
400	-14.043	-14.088	-14.139	-14.195	-14.257	-14.326	-14.402	-14.487	-14.581	-14.686	-14.803	-14.934	-15.082	-15.248	-15.437
410	-14.107	-14.154	-14.206	-14.264	-14.328	-14.399	-14.478	-14.566	-14.663	-14.771	-14.891	-15.027	-15.179	-15.350	-15.544
420	-14.171	-14.219	-14.273	-14.333	-14.399	-14.472	-14.553	-14.643	-14.743	-14.855	-14.979	-15.118	-15.275	-15.451	-15.650
430	-14.233	-14.283	-14.339	-14.400	-14.469	-14.544	-14.627	-14.720	-14.823	-14.937	-15.065	-15.209	-15.369	-15.551	-15.754
440	-14.295	-14.346	-14.404	-14.467	-14.537	-14.615	-14.701	-14.796	-14.902	-15.019	-15.151	-15.298	-15.463	-15.649	-15.855
450	-14.355	-14.409	-14.468	-14.533	-14.605	-14.685	-14.773	-14.871	-14.979	-15.100	-15.235	-15.386	-15.556	-15.745	-15.955
460	-14.415	-14.470	-14.531	-14.598	-14.672	-14.754	-14.844	-14.945	-15.056	-15.180	-15.319	-15.474	-15.647	-15.840	-16.052
470	-14.474	-14.531	-14.593	-14.662	-14.738	-14.822	-14.915	-15.018	-15.133	-15.260	-15.402	-15.560	-15.737	-15.933	-16.146
480	-14.533	-14.591	-14.655	-14.726	-14.804	-14.890	-14.985	-15.091	-15.208	-15.338	-15.483	-15.645	-15.825	-16.024	-16.238
490	-14.593	-14.650	-14.716	-14.788	-14.868	-14.957	-15.054	-15.163	-15.283	-15.416	-15.564	-15.729	-15.912	-16.113	-16.326
500	-14.647	-14.709	-14.776	-14.850	-14.932	-15.023	-15.123	-15.234	-15.356	-15.493	-15.644	-15.812	-15.997	-16.199	-16.411
510	-14.704	-14.767	-14.836	-14.912	-14.996	-15.089	-15.191	-15.304	-15.430	-15.569	-15.723	-15.894	-16.081	-16.283	-16.492
520	-14.760	-14.824	-14.895	-14.973	-15.059	-15.154	-15.258	-15.374	-15.502	-15.644	-15.801	-15.974	-16.163	-16.364	-16.569
530	-14.815	-14.881	-14.953	-15.033	-15.121	-15.218	-15.325	-15.443	-15.574	-15.718	-15.877	-16.052	-16.242	-16.443	-16.642
540	-14.870	-14.937	-15.011	-15.093	-15.183	-15.282	-15.391	-15.511	-15.645	-15.791	-15.953	-16.130	-16.320	-16.518	-16.711
550	-14.924	-14.993	-15.069	-15.152	-15.244	-15.345	-15.456	-15.579	-15.715	-15.864	-16.027	-16.205	-16.395	-16.590	-16.776

TABLE 2.—Densities as a function of height and exospheric temperature (decimal logarithms, g/cm³)—Continued

T_∞ / z	1350	1300	1250	1200	1150	1100	1050	1000	950	900	850	800	750	700	650
560	-14.978	-15.048	-15.126	-15.211	-15.305	-15.408	-15.521	-15.646	-15.784	-15.935	-16.100	-16.279	-16.467	-16.659	-16.836
570	-15.031	-15.103	-15.182	-15.269	-15.365	-15.470	-15.585	-15.712	-15.852	-16.005	-16.172	-16.350	-16.538	-16.724	-16.893
580	-15.084	-15.157	-15.238	-15.327	-15.424	-15.531	-15.649	-15.778	-15.920	-16.074	-16.242	-16.420	-16.605	-16.786	-16.946
590	-15.136	-15.211	-15.294	-15.384	-15.483	-15.592	-15.712	-15.843	-15.986	-16.142	-16.310	-16.488	-16.669	-16.845	-16.995
600	-15.188	-15.265	-15.349	-15.441	-15.542	-15.653	-15.774	-15.907	-16.052	-16.209	-16.377	-16.553	-16.731	-16.900	-17.040
610	-15.239	-15.318	-15.403	-15.497	-15.600	-15.712	-15.835	-15.970	-16.116	-16.274	-16.441	-16.616	-16.789	-16.951	-17.083
620	-15.290	-15.370	-15.457	-15.553	-15.657	-15.771	-15.896	-16.032	-16.179	-16.337	-16.504	-16.676	-16.845	-17.000	-17.123
630	-15.341	-15.422	-15.511	-15.608	-15.714	-15.830	-15.956	-16.093	-16.241	-16.400	-16.565	-16.734	-16.898	-17.046	-17.160
640	-15.391	-15.474	-15.564	-15.663	-15.770	-15.888	-16.015	-16.154	-16.302	-16.460	-16.624	-16.790	-16.948	-17.089	-17.195
650	-15.441	-15.525	-15.617	-15.717	-15.826	-15.945	-16.074	-16.213	-16.362	-16.519	-16.681	-16.843	-16.995	-17.129	-17.228
660	-15.491	-15.576	-15.669	-15.771	-15.881	-16.001	-16.131	-16.271	-16.420	-16.576	-16.736	-16.893	-17.040	-17.167	-17.259
670	-15.540	-15.627	-15.721	-15.824	-15.936	-16.057	-16.188	-16.328	-16.477	-16.632	-16.788	-16.941	-17.082	-17.203	-17.289
680	-15.588	-15.677	-15.772	-15.877	-15.990	-16.112	-16.244	-16.384	-16.532	-16.685	-16.839	-16.987	-17.122	-17.237	-17.318
690	-15.637	-15.726	-15.823	-15.929	-16.043	-16.166	-16.298	-16.439	-16.586	-16.737	-16.887	-17.030	-17.160	-17.269	-17.345
700	-15.685	-15.775	-15.874	-15.980	-16.095	-16.219	-16.352	-16.492	-16.638	-16.787	-16.933	-17.071	-17.196	-17.300	-17.371
710	-15.732	-15.824	-15.923	-16.031	-16.147	-16.272	-16.405	-16.544	-16.689	-16.834	-16.977	-17.110	-17.230	-17.329	-17.396
720	-15.779	-15.872	-15.973	-16.081	-16.198	-16.323	-16.456	-16.595	-16.738	-16.880	-17.019	-17.147	-17.262	-17.357	-17.421
730	-15.826	-15.920	-16.021	-16.131	-16.249	-16.374	-16.506	-16.644	-16.785	-16.924	-17.059	-17.183	-17.293	-17.385	-17.445
740	-15.872	-15.967	-16.070	-16.180	-16.298	-16.424	-16.556	-16.692	-16.830	-16.967	-17.097	-17.216	-17.323	-17.411	-17.468
750	-15.918	-16.014	-16.117	-16.228	-16.347	-16.472	-16.603	-16.738	-16.874	-17.007	-17.133	-17.248	-17.351	-17.436	-17.490
760	-15.963	-16.060	-16.164	-16.276	-16.394	-16.520	-16.650	-16.783	-16.916	-17.046	-17.167	-17.279	-17.378	-17.461	-17.512
770	-16.008	-16.106	-16.211	-16.323	-16.441	-16.566	-16.695	-16.827	-16.957	-17.083	-17.200	-17.308	-17.405	-17.485	-17.534
780	-16.052	-16.151	-16.256	-16.369	-16.487	-16.612	-16.739	-16.869	-16.996	-17.118	-17.232	-17.337	-17.430	-17.508	-17.555
790	-16.096	-16.195	-16.301	-16.414	-16.532	-16.656	-16.782	-16.909	-17.033	-17.152	-17.262	-17.364	-17.455	-17.531	-17.576
800	-16.140	-16.239	-16.346	-16.458	-16.576	-16.699	-16.824	-16.948	-17.069	-17.184	-17.291	-17.390	-17.479	-17.554	-17.597
810	-16.183	-16.283	-16.389	-16.502	-16.620	-16.741	-16.864	-16.985	-17.103	-17.215	-17.319	-17.415	-17.503	-17.576	-17.617
820	-16.225	-16.326	-16.432	-16.545	-16.662	-16.781	-16.902	-17.021	-17.136	-17.244	-17.346	-17.440	-17.525	-17.597	-17.637
830	-16.267	-16.368	-16.475	-16.587	-16.703	-16.821	-16.940	-17.056	-17.167	-17.273	-17.371	-17.463	-17.548	-17.619	-17.656
840	-16.308	-16.409	-16.516	-16.627	-16.742	-16.859	-16.976	-17.089	-17.198	-17.302	-17.396	-17.487	-17.570	-17.640	-17.675
850	-16.349	-16.450	-16.557	-16.667	-16.781	-16.896	-17.010	-17.121	-17.227	-17.326	-17.420	-17.509	-17.592	-17.661	-17.694
860	-16.389	-16.490	-16.596	-16.706	-16.819	-16.932	-17.044	-17.152	-17.255	-17.352	-17.444	-17.531	-17.613	-17.681	-17.713
870	-16.428	-16.530	-16.635	-16.745	-16.856	-16.967	-17.076	-17.181	-17.282	-17.376	-17.467	-17.553	-17.634	-17.701	-17.732
880	-16.467	-16.568	-16.673	-16.782	-16.891	-17.001	-17.107	-17.210	-17.307	-17.400	-17.489	-17.574	-17.655	-17.721	-17.750
890	-16.505	-16.606	-16.711	-16.818	-16.926	-17.033	-17.137	-17.237	-17.332	-17.423	-17.510	-17.595	-17.675	-17.741	-17.768
900	-16.543	-16.643	-16.747	-16.853	-16.959	-17.064	-17.166	-17.264	-17.356	-17.445	-17.532	-17.616	-17.696	-17.761	-17.785
910	-16.580	-16.680	-16.783	-16.887	-16.992	-17.094	-17.194	-17.289	-17.380	-17.467	-17.552	-17.636	-17.716	-17.780	-17.803
920	-16.616	-16.715	-16.817	-16.920	-17.023	-17.123	-17.221	-17.313	-17.402	-17.488	-17.573	-17.656	-17.735	-17.799	-17.820
930	-16.651	-16.750	-16.851	-16.952	-17.053	-17.152	-17.246	-17.337	-17.424	-17.509	-17.593	-17.676	-17.755	-17.818	-17.837
940	-16.686	-16.784	-16.884	-16.984	-17.083	-17.179	-17.271	-17.360	-17.446	-17.529	-17.613	-17.695	-17.774	-17.837	-17.854
950	-16.720	-16.817	-16.916	-17.014	-17.111	-17.205	-17.295	-17.382	-17.466	-17.549	-17.632	-17.715	-17.794	-17.855	-17.870
960	-16.753	-16.850	-16.947	-17.043	-17.138	-17.230	-17.319	-17.404	-17.487	-17.569	-17.651	-17.734	-17.813	-17.874	-17.886
970	-16.786	-16.881	-16.977	-17.072	-17.165	-17.255	-17.341	-17.425	-17.506	-17.588	-17.670	-17.753	-17.832	-17.892	-17.902
980	-16.818	-16.912	-17.006	-17.099	-17.190	-17.278	-17.363	-17.445	-17.526	-17.607	-17.689	-17.772	-17.850	-17.910	-17.918
990	-16.849	-16.942	-17.035	-17.126	-17.215	-17.301	-17.384	-17.465	-17.545	-17.625	-17.707	-17.791	-17.869	-17.928	-17.934
1000	-16.879	-16.971	-17.062	-17.152	-17.239	-17.323	-17.405	-17.484	-17.563	-17.644	-17.726	-17.809	-17.888	-17.945	-17.949

U S GOVERNMENT PRINTING OFFICE 1965 O—781-252